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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

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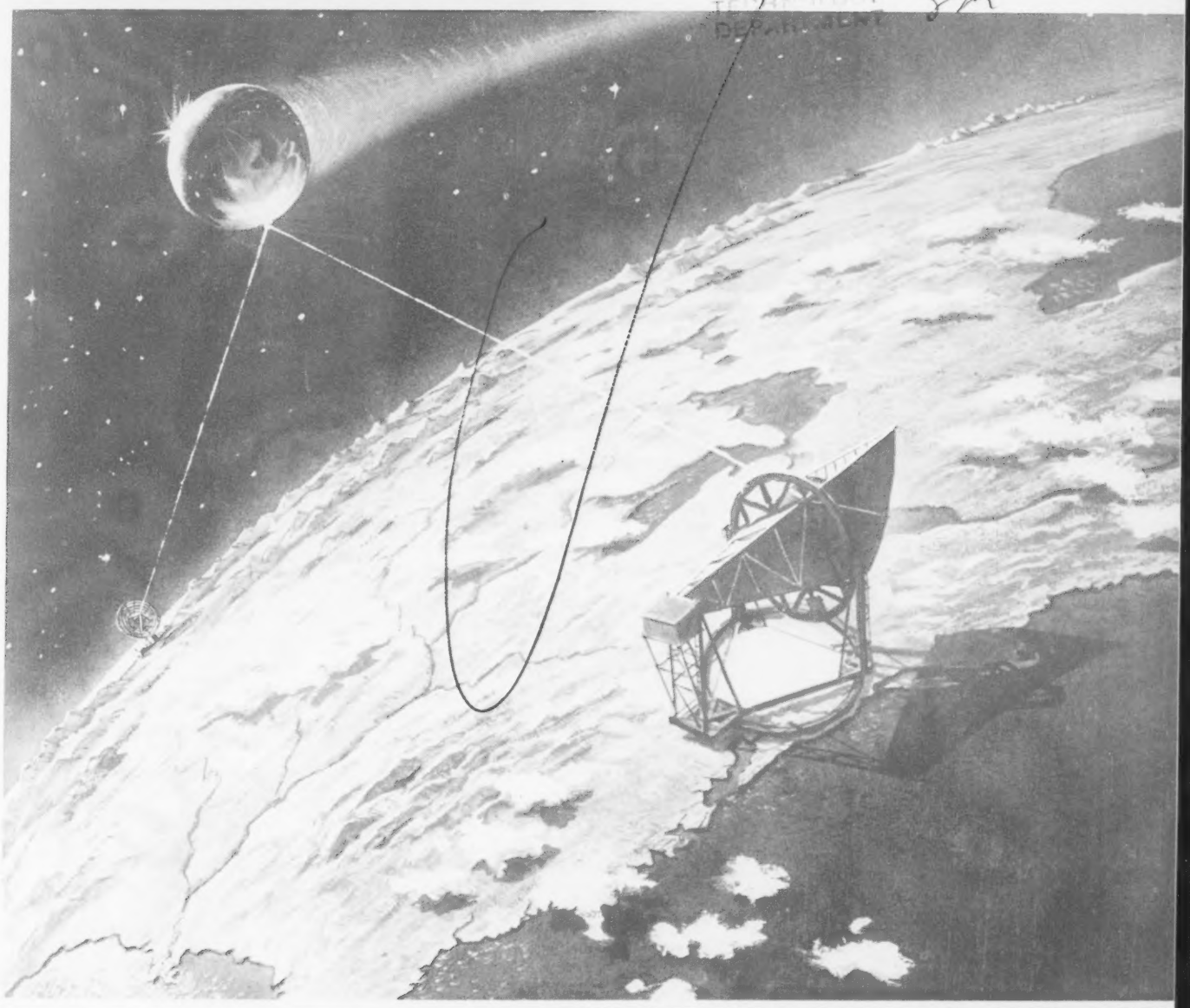


PRINCIPLES OF REGULATION, by Marion Beatty

Your Absence Control Program, by D. A. Perigo

DO BILL STUFFERS GET RESULTS? by Allan R. Stacey

Plant Engineering Notes, by John S. Reed

Let our "Revenue Men"

TAKE THE KINKS OUT OF YOUR KNOTTY DIRECTORY PROBLEMS!

Take a man like
Joe Mirabella...

Joe is one of our "revenue men" in St. Paul, Minnesota.

Young, energetic, he is representative of the "revenue men" who help telephone companies increase their revenue from directory sales.

Joe started work at the General Telephone Directory Company as a sales representative in Muskegon, Michigan, in 1954. In 1958, he was promoted to sales supervisor of the Owosso unit. In 1959, he was transferred to his present post in St. Paul.

He and his wife and three daughters now live in Minnesota. Always interested in community affairs, Joe has held the positions of Post Commander, District Vice-Commander and State Housing Chairman of the American Legion. He has also devoted his time and efforts to the VFW, Community Chest and Red Cross.

Joe is typical of the "revenue men" who work for General Telephone Directory Company—and for you. Men who are an asset to any community in which they live.

Our Directory "Revenue Men" provide the Independent Telephone Industry with a flexible and highly skilled telephone directory organization. These men—working out of 35 strategic locations—are experienced specialists, trained to give you *complete* and *quality directory service.*

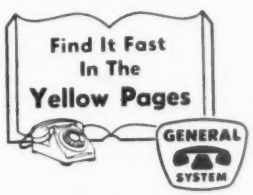
They act as telephone company representatives in their day-to-day contacts with your customers, not only selling and supervising the sale of Yellow Pages advertising—but also acting as public relations representatives for you in their dealings with the public.

Thoroughly trained to know any condition that pertains to telephone service, they're experienced hands at helping large and small Independent Telephone Companies "take the kinks out of knotty directory problems!"

Write or phone our office nearest you for our Complete Directory Service Plan.

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Oakton Boulevard
Des Plaines, Illinois
VAnderbilt 7-6111



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Has your toll timing system kept pace with these CALCULAGRAPH IMPROVEMENTS?

NEW COLOR-CODED HANDLES

This "visual aid" to better accuracy is a big help to busy operators—excellent for trainees, too. These new handles in color—green for start, red for finish, can be installed in minutes.

NEW SETBACK HANDLE

Now you can use ANY SIZE toll ticket—in operated position handle cannot damage toll ticket. This new feature permits Calculagraph to be used with any card system.

NEW 60-MINUTE DIAL

Busy operators can now handle more calls more efficiently because there's no need to depend on memory or manual computations on long conversations. Assures you, too, of all charges due on every call.

Check your own switchboard now. If you don't have all these Calculagraph improvements, it's time to modernize and incorporate these benefits into your toll timing system.

Your busy operators will like these easier-to-use color-coded handles; the 60-minute dial will eliminate possible human errors in recording long conversations, saving you "lost-time" dollars; and, you will like the flexibility in card sizes permitted by the set back handle. They all add up to faster, easier, more accurate toll time recording.

Call your Calculagraph distributor today. He'll be glad to discuss your modernization plans with you.

FOR LONG-TIME CALCULAGRAPH USERS ONLY

If you are now using the old "round-type" Calculagraphs, you can easily convert to the rectangular Model 33 (shown here) with the convenient adapter plate that requires just a few minutes to install.

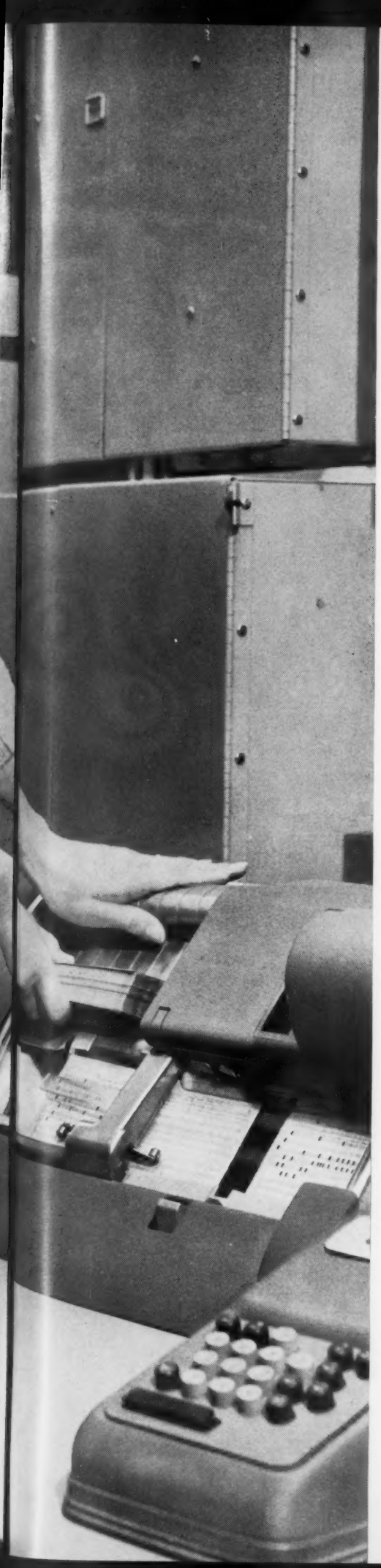
CALCULAGRAPH Company

308 SUSSEX STREET • HARRISON, NEW JERSEY

TELEPHONE: HUMBOLDT 2-0213

MANUFACTURERS OF ELAPSED TIME RECORDERS FOR OVER 65 YEARS

Flexowriter
TICKET WAITING
ALARM



"THERE IS NOTHING FINER THAN A STROMBERG-CARLSON"

Your profit

goes up as your revenue increases with XY® Toll Ticketing

There are many reasons why your DDD profit will keep pace with growing revenue. Here are three major ones:

1. Your profit goes up because the system is fully automated . . . requires a minimum of labor to collect information to bill subscribers for toll service. No paper tapes to replenish. Billing machines are operated directly from the toll ticketing equipment.

2. Your profit goes up because of complete compatibility. Your subscribers dial directly into the nationwide system. No toll operators required to complete station-to-station calls.

3. Your profit goes up because of dependability and speed . . . combining the best features of electromechanical and electronic devices insures low maintenance with high reliability, plus high speed to handle more toll messages per day.

Get the extra revenue plus extra profit of DDD with XY Toll Ticketing. Your Stromberg-Carlson representative can give you all the facts and figures.

In Atlanta call TRinity 5-7467; in Chicago STate 2-4235; in Kansas City HArrison 1-6618; in Rochester HUbbard 2-2200; in San Francisco OXford 7-3630.

STROMBERG-CARLSON
A DIVISION OF **GENERAL DYNAMICS**

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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

VOL. 64, NO. 7 APRIL 1, 1960

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The TE&M Front Cover

Artist's conception of telephone transmission via space satellite. Bell Telephone Laboratories will take part in the National Aeronautics and Space Administration's "Project Echo" to test whether satellite transmission will be feasible for trans-oceanic communication. In foreground of the illustration is the "horn antenna," a highly directional receiver designed at Bell Laboratories and being constructed at Holmdel, N. J. The satellite will be of plastic, 100 feet in diameter. The antenna on the left in the sketch will be located at the Jet Propulsion Laboratory at Goldstone, Calif. A similar antenna will be located at Holmdel.

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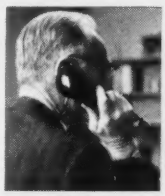
POSTMASTER . . . Please send form 3579 to TELEPHONE ENGINEER & MANAGEMENT, 7720 N. Sheridan Rd., Chicago 26, Ill.

"We'll keep in touch!"

FRED: How are you, Bill? Glad I got through to you in all this wild weather!



BILL: Boy, am I glad to hear your voice! We're having trouble now, and we expect more. So we'll be needing lots of things—pronto.

FRED: Go ahead, Bill. I'm listening.

BILL: Better shoot us 30,000 feet of drop wire . . . 6 boxes of repair splicing sleeves . . . 15,000 feet of 11-pair and 30,000 feet of 6-pair rural distribution wire . . . and a couple of hundred crossarm bolts, lag screws and anchor rods. How soon can we expect delivery?

FRED: Tomorrow morning O.K.?

BILL: Fine. And Fred—stand by for more rush orders—if I can get through.

FRED: If not, we'll send one of our men down. Anyway, we'll keep in touch!

STROMBERG-CARLSON
A DIVISION OF **GENERAL DYNAMICS**

ANTA: TRINITY 5-7467; CHICAGO: STATE 2-4235; KANSAS CITY: HARRISON 1-6618; ROCHESTER: HUBBARD 2-2200; SAN FRANCISCO: OXFORD 7-3630.

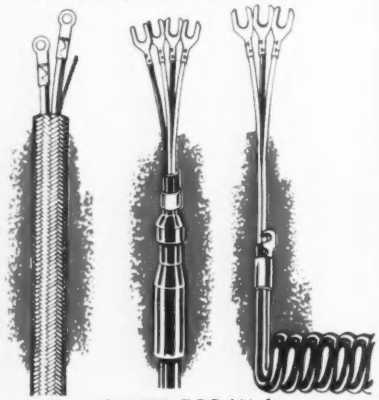
Don't worry Henry...
COMCO CORDS
NEVER LET YOU DOWN!

...and that's no joke
where phone cord
serviceability is concerned

Whether it is a handset, deskstand, switchboard, or inter-communication system cord, COMCO quality guarantees top year-in, year-out performance. From rugged Spiraflex Retractile cords in standard or extended lengths (10, 15 or 25 ft.) with black or colored P.V.C. jackets, to durable Nylon jacketed Operator cords, in black or brown, each COMCO Cord boasts built-in reliability to eliminate service worries. Moreover, all standard cords are **in stock**, ready for rapid delivery on your order!

Special cords a COMCO specialty, too!

Patch cords, transmitter cords, test and inter-communication cords are all quickly available from COMCO, and cords made to your exact specifications require little more than an immediate delivery schedule. Determining the exact time required for delivery of your problem cord takes only a call to COMCO. Why not make it today?



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AUTOMATIC ELECTRIC SALES CORP.
Northlake, Ill.

COMING CONVENTIONS

IOWA Telephone Association, Ft. Des Moines Hotel, Des Moines, Iowa, April 5-6.

NEBRASKA Telephone Association, Sheraton-Fontenelle Hotel, Omaha, Nebraska, April 19-20.

INDIANA Telephone Association, Claypool Hotel, Indianapolis, Indiana, May 4-5.

WISCONSIN Telephone Association, Plankinton House, Milwaukee, Wisc., May 10-11.

ILLINOIS Telephone Association, Abraham Lincoln Hotel, Springfield, Ill., May 19-20.

KANSAS-MISSOURI Telephone Associations, Town House, Kansas City, Kans., May 23-24.

PENNSYLVANIA Telephone Association, Bedford Springs Hotel, Bedford Springs, Pa., June 6-7.

CALIFORNIA Telephone Association, Fairmont Hotel, San Francisco, Calif., June 8-10.

WASHINGTON-OREGON Telephone Associations, Sheraton Portland Hotel, Portland, Ore., June 16-17.

NEW YORK Telephone Association, Scaroon Manor, Schroon Lake, N. Y., June 20-22.

TENNESSEE Telephone Association, Hermitage Hotel, Nashville, Tenn., Sept. 7-8.

MICHIGAN Telephone Association, Grand Hotel, Mackinac Island, Mich., Sept. 12-13.

ARKANSAS Telephone Association, Velda Rose Motel, Hot Springs, Arkansas, Sept. 12-13.

ROCKY MOUNTAIN Telephone Association, Hilton Hotel, Denver, Colorado, Sept. 14-16.

NEVADA Telephone Association, Hotel Nevada, Ely, Nevada, Sept. 21, 22, 23.

NEW ENGLAND Telephone Association, Mt. Washington Hotel, Bretton Woods, N. H., Sept. 25-28.

NORTH CAROLINA Telephone Association, Carolina Hotel, Pinehurst, N. C. Oct. 3-4.

U. S. INDEPENDENT Telephone Association, National Convention, Conrad Hilton Hotel, Chicago, Ill., Oct. 9-12.

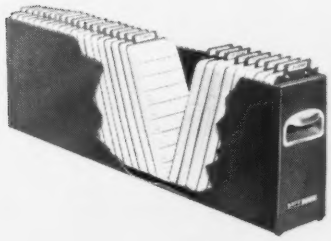
SOUTH CAROLINA Telephone Association, Clemson House, Clemson, South Carolina, Oct. 24, 25.

VIRGINIA Telephone Association, Hotel Roanoke, Roanoke, Va., Oct. 27-28.

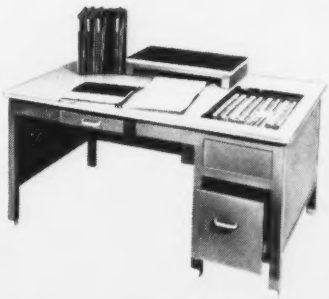
OKLAHOMA Telephone Association, Skirvin Hotel, Oklahoma City, Nov. 9-10.

FLORIDA Telephone Association, Hotel Robert Meyer, Jacksonville, Florida, Nov. 28, 29.

ONE FINGER ACCESS to line cards is assured by Supported V-Angle that opens and stays open at any card. Measured space control insures space for refiling.



ASSIGNMENT-REPAIR DESK conveniently centralizes cable, terminal and line card records. Saves waste motion and affords generous desk-top work surface.



COMPACT TUBULAR STAND This space-saving unit handles up to 3000 stations. Provides convenient sliding work shelf. Rolls on ball-bearing casters.

ACME VISIBLE Telephone Record Systems speed installation and repair service

Today, with a record number of telephones in service—and with continued heavy station growth—efficient paper work and quick reference systems are vital. Many central offices have upped their efficiency by using Acme Visible Systems, designed in partnership with telephone operations experts.

ACME VISIBLE

Serving all departments of telephone companies
ACME VISIBLE RECORDS, Inc.
4104 West Allview Drive, Crozet, Va.

Please send free literature on your systems for telephone records.

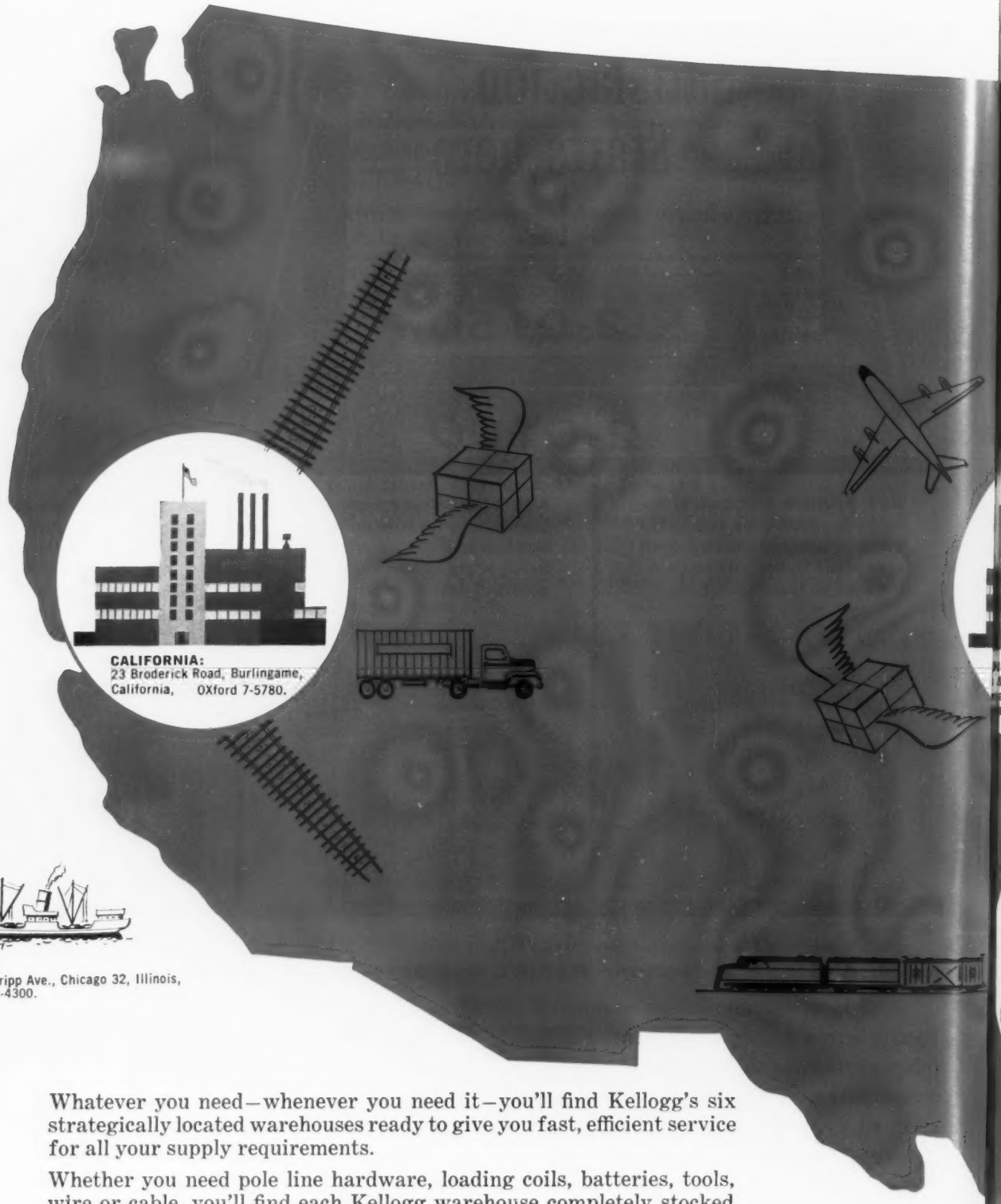
We have _____ line cards and _____ cable and terminal records.

NAME_____ TITLE_____

COMPANY_____ ADDRESS_____

CITY_____ ZONE____ STATE_____

When you need supplies, qu



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California, OXford 7-5780.

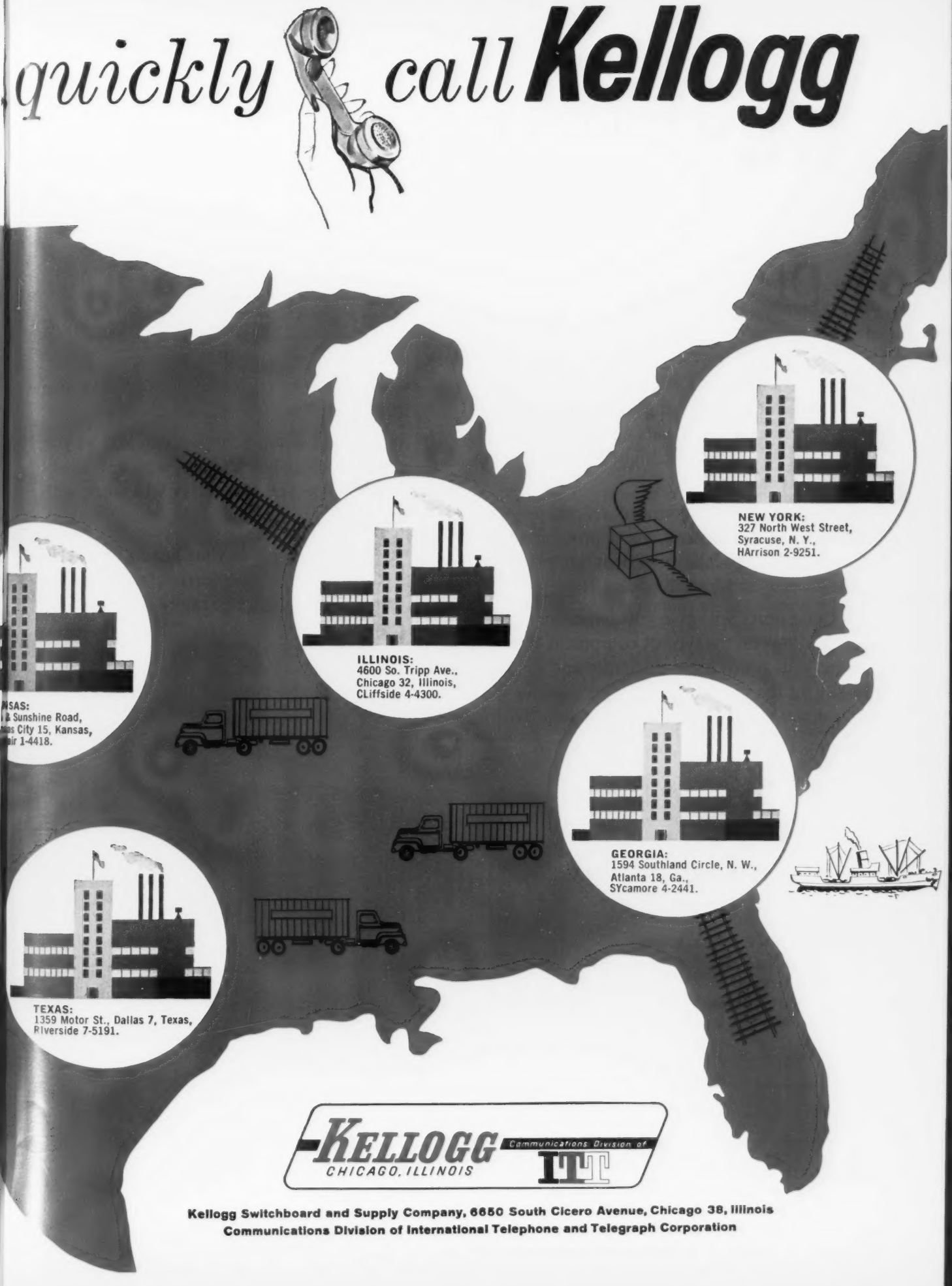
EXPORT:
4600 So. Tripp Ave., Chicago 32, Illinois,
CLiffside 4-4300.

Whatever you need—whenever you need it—you'll find Kellogg's six strategically located warehouses ready to give you fast, efficient service for all your supply requirements.

Whether you need pole line hardware, loading coils, batteries, tools, wire or cable, you'll find each Kellogg warehouse completely stocked with everything needed to equip and maintain a telephone company. Each warehouse is organized to process and ship supply orders as soon as they come in the door!

For proof—send your next supply order to your local Kellogg representative . . . or call it in direct to your nearest Kellogg warehouse, and find out why more and more companies CALL KELLOGG FOR SUPPLIES.

quickly call Kellogg



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CHICAGO, ILLINOIS
Communications Division of
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Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Illinois
Communications Division of International Telephone and Telegraph Corporation

AE-Lenkurt has everything you need for profitable circuit expansion

Dealing with AE-Lenkurt is mighty good assurance of getting things done *the right way* from start to finish. That's because we offer a complete "package," designed to meet your precise needs.

You deal with experienced *telephone* engineers who understand your problems, and stand ready to relieve you of all planning, engineering and installing details.

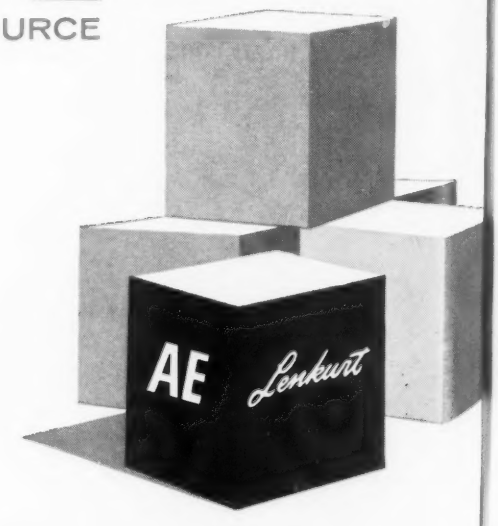
Our engineers will give you *impartial* recommendations on the type of equipment that will serve your needs most efficiently and economically for the long pull. That's because we offer a *complete* line of communications equipment, and we have no reason to "push" any one system.

With Lenkurt equipment you can add as you go, the "building-block" way, with full assurance that what you buy today will work with what you buy tomorrow.

In addition, AE can be your headquarters for everything from cable to carrier, from micrometers to microwave—separately or in a completely integrated package.

Want more facts on progressive planning? Then call your Automatic Electric representative, or mail coupon today.

ALL YOUR COMMUNICATIONS NEEDS FROM ONE DEPENDABLE SOURCE



Automatic Electric Sales Corporation,
Northlake, Illinois
Attention: Mr. T. B. Collins, Manager

Please send literature on:

- ☐ Lenkurt Carrier
- ☐ Lenkurt Microwave
- ☐ Lenkurt Mobiltel
- ☐ Lenkurt Datatel
- ☐ AE Telephone Equipment and Supplies

Name_____

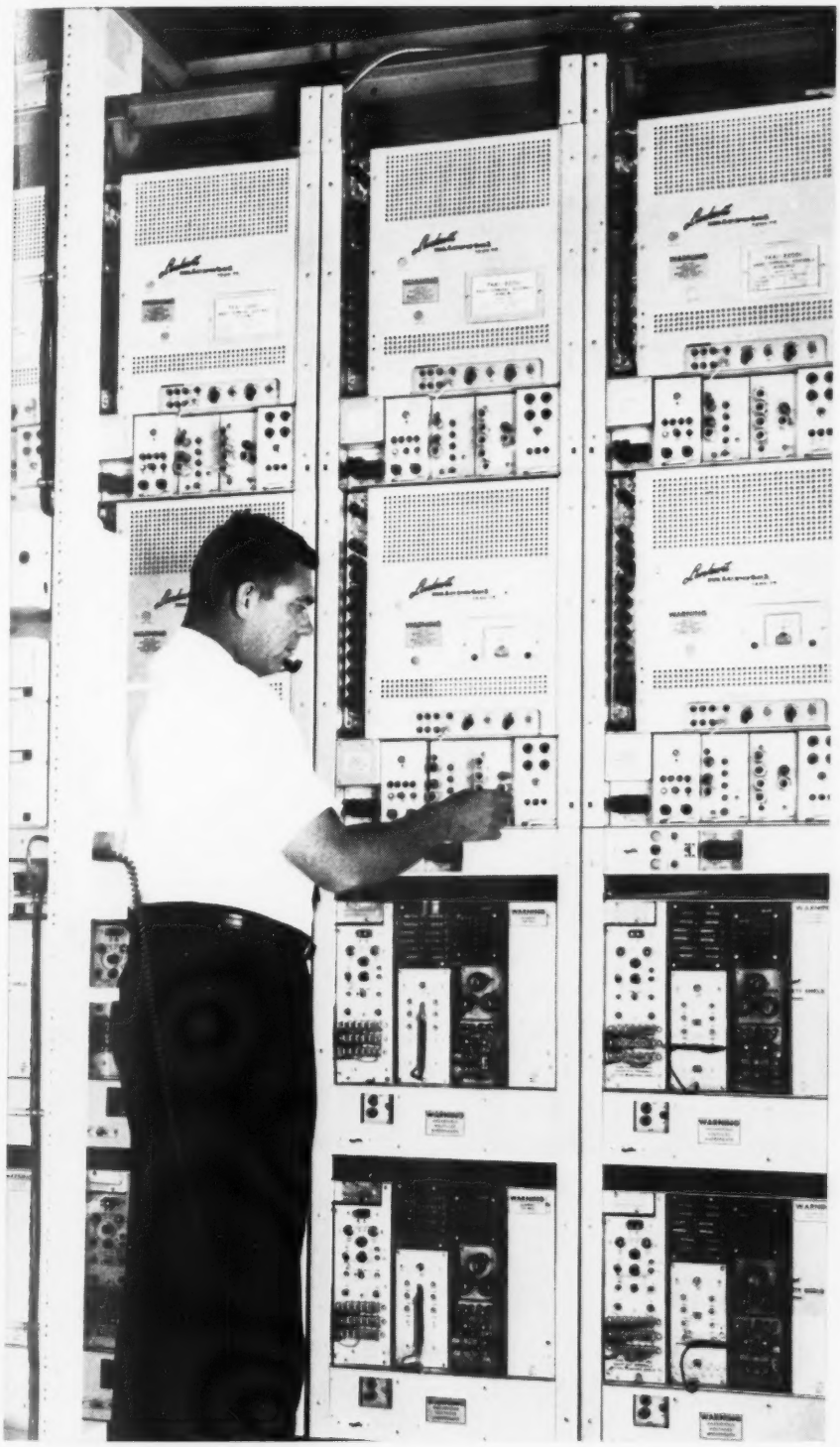
Title_____

Company_____

Address_____

City_____ Zone____ State_____

In Canada: Automatic Electric Sales (Canada) Ltd.,
185 Bartley Dr., Toronto 16, Ont.



Lenkurt Microwave, for instance–

Lenkurt *microtel* Type 74A is *telephone-engineered* to meet all telephone standards.

With Lenkurt 45BX Carrier, a single 6000-mc unit can accommodate from 4 to 240 channels.

Check these features:

Economical: Power consumption only 250 watts. Uses fewer tubes and operates from office batteries or power line. Automatic frequency control dispenses with need of ovens or blowers.

Efficient: Makes maximum use of available frequency spectrum; has higher power output; requires lower input (system gain 10 times that of most other equipment).

System Expansion: With r-f circulators 2, 3 or 4 terminals can be added to same antenna system, quickly, economically.

Circuit Flexibility: Back-to-back terminal equipment permits dropping and reinserting of channel groups at repeater points.

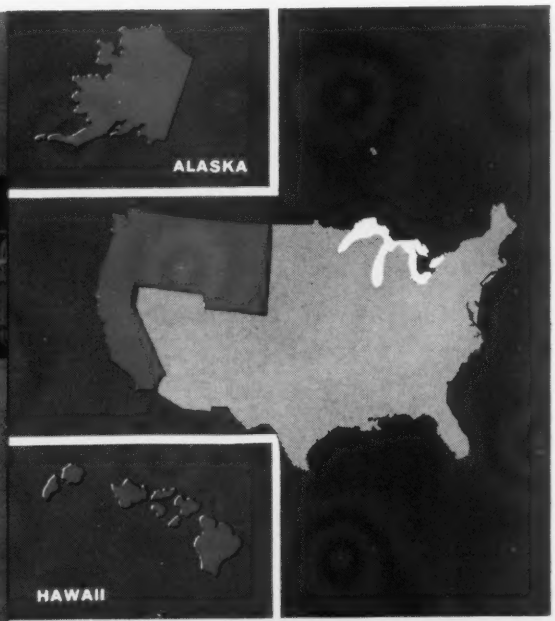
AUTOMATIC ELECTRIC

Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

in the far west

TELEPHONE MEN CHOOSE STROWGER!



BERT JOHNSON
(local manager,
Pacific Power & Light Company)
is pleased with the operation of
Strowger equipment at the
Columbia Falls, Montana, exchange.
This is just one of the many dial
exchanges in the Far West served
by Strowger. See full list at right.

FAR WEST DIAL EXCHANGES
SERVED BY STROWGER:

ALASKA

Fairbanks
Haines
Nenana
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Seward
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Bieber
Big Bear Lake
Big Pine
Biola
Bishop
Boron
Bridgeport
Buttonwillow
Carpinteria
Clements
Coachella
Coleville
Colfax
Corcoran
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Covina
Crestland
Crowley Lake
Desert Hot Springs
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Kernville
Kerman
Laguna Beach
Lake Hughes
Lancaster
La Quinta
Leevining
Lindsey
Lompoc
Lone Pine
Long Beach
Los Alamos
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Perris
Pine Creek
Pomona
Princeton
Randsburg
Redlands
Redondo
Reedley
Ridgecrest
Roseville
Running Springs
San Bernardino
San Fernando
Sanger
San Joaquin
Santa Barbara
Santa Maria
Santa Ynez
Sierra Madre
Sunland
Taft
Thermal
Thousand Oaks
Trona
Twenty-nine Palms
Victorville
Walnut Grove
West Los Angeles
Westminster
Westwood
West Point
Whittier
Williams

HAWAII

All Hawaiian exchanges are served by Strowger!

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Mineral
Monroe
Mount Vernon
Naches
Oak Harbor
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Prescott
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Pullman
Redmond
Richmond Beach
Sedro Woolley
Selah
Snohomish
Suquamish
Tenino
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Washougal
Washtucna
Wenatchee
Winthrop
Woodland

WYOMING

Guernsey
Sinclair

TELEPHONE MEN IN THE FAR WEST are pretty much like telephone men across the nation—they insist on the best in dial switching equipment. That's why so many Independent telephone men choose Strowger! The number of Independent stations served by Strowger far exceeds those served by all other makes of dial switching equipment *combined!*

NORTH, SOUTH, EAST or WEST, Strowger is best! You can prove this for yourself. Just visit a Strowger exchange and ask the owners if they're satisfied with their dial equipment. Then, get in touch with us. We'll be glad to help you plan for your next dial conversion. Just write Automatic Electric Sales Corporation, Northlake, Illinois, or call Fillmore 5-7111.

AUTOMATIC ELECTRIC

GENERAL SYSTEM

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

"BITS FROM HERE and THERE"
By L. A. GRITTEN

INDUSTRY OBSERVATIONS

Rate Making Blues

IN ARKANSAS, *Southwestern Bell* needed a $425,000 annual rate increase, to meet the impact of five wage increases since the present rates were established, heavy increases in the cost of capital, and a $75 million expansion program planned for the next five years. What it got was a "show cause" order in April 1959, from the Arkansas Commission, calling for a $3,000,000 annual rate reduction.

Now the Commission has ordered that the rates shall remain as they are, with no raises and no reductions. That is all we know of this particular case; but it seems to follow a painfully familiar pattern.

Utility rate making is supposed to be a process based on scientific reasoning and a strictly objective approach. Often enough, what actually happens leaves one with the sort of impression that one gains from prolonged haggling with an itinerant Oriental over the price of a rug.

Let us hope that the wave of electronic computation now sweeping the world will bring about the acceptance of a machine that, when fed with the relevant data, will furnish fair and proper telephone rate schedules in a few minutes. Modern telecommunication deserves something better than these long months of tedious, quasi-scientific, politically dominated rate arguments. The best that can be said for them is that they are meat for the lawyers and pie for the socialists.

"Kitty, Kitty, Kitty!"

CAT CLIMBS pole. Customer calls office. Lineman retrieves cat. That is routine with most telephone companies; but we note with sorrow that nothing much is done about it. There is no U.S.I.T.A. sub-committee on cat publicity; there is not even an A.T. & T. Company Vice President-Feline Operations.

Why this frivolity, you ask? In Seattle, recently, a cat-pole-lineman incident caught the eye of a City Light public relations man who knew his business. The result was a quarter-page feature in the Hearst daily, with big photographs and all the details, lineman climbing 75 feet into a high voltage menace, cat dashing away without saying "Thank you," and so on.

That sort of yarn appeals to everyone. The most bitter utility hater has a soft spot for a kitten in distress, and for the people who go out of their way to save its silly little life. Nothing so quickly thaws John Customer's coolness toward the mechanized utility whose only normal contact with him is a monthly bill. Perhaps a good cat-pole-rescue story should be run concurrently with every public rate increase hearing.

"It Ain't Fair!"

WE ARE told that the answers to the U.S.I.T.A. Telephone Marketing Committee's questionnaire "indicated that the most productive single technique was waiving installation charges on extensions."

Based on some past experience, we have a doubt. Productive of what? Extra rentals, of course. But these special waivers also produce resentments that may in the long run far outweigh the gain. If you doubt that, interview the girl who paid a $5 installation charge for her extension telephone last month, and who now learns that her neighbor installed one yesterday "for free."

Centralization Marches On

RAYTHEON Manufacturing Co. is in course of eliminating all of its field warehouses. In a few weeks, its distributor products will be sent direct to customers from one huge "Unicenter" at Westwood, Mass. About $250,000 will be saved annually and service will be faster. Air freight, automatic telegraph communication and electronically-processed order taking and inventory control will take over.

This marks a trend that may change the face of every business. "Pilots of the purple twilight, dropping down with costly bales" will supersede our present transportation in a fashion that not even the prophetic Tennyson could imagine. Our railroads, like our canals, will become museum pieces; our highways will be for tourists only; and, alas, local individuality will be centralized out of recognition.

"May We Help You?"

IN RECENT months, operators of the *West Coast Telephone Co.* have dropped the curt "Operator" greeting. Their voices dripping with honey, they now answer — "May we help you?"

Further, if the operator thinks the customer has been waiting more than a few seconds, she prefaces her greeting with — "Sorry you had to wait."

It is proving to be a good innovation. Now, as ever, "a soft answer turneth away wrath" — and politeness goes hand in hand with efficiency.

Purity Conquers All

THANKS in part to *Charles Van Doren* and the television scandals, we have now entered an era of pro-

fessional and commercial purity. No longer may you be told that someone's little pills will restore your ruined liver, or that octogenarians will turn into Casanovas overnight if they take Soanso's vitamin tablets. And after the usual television canned applause, a voice now solemnly informs you that — "Audience reaction is technically augmented"!

The New York District Attorney has gone a step further. He has raided several ghost-writing agencies and subpoenaed the ghosts. As a logical sequence to this, we may expect that soon every business or professional man will be compelled either to compose his own speeches or to announce their source publicly.

Then there will be a sudden end to American life as we know it. A dreadful, tomb-like hush will envelop the nation, from the White House to the most remote small town Chamber of Commerce. Public meetings will be cancelled or will dissolve in confusion. Civic and business leaders will hide in their offices and refuse to answer their phones. And in Congress — No, here our imagination balks. You take it from here.

Strain Or Stress?

SOME time ago, we wrote that if the sag in a telephone line were reduced to zero, then "the tensile strain would be infinite." In correct engineering parlance, as *N. L. J. Smith*, of the *Stromberg Carlson Co.* in Rochester, N. Y., humorously informed us, we should have said "stress," not "strain."

Grieved by Mr. Smith's gentle implication of our literary sloppiness, we conducted a "Gallup" poll of sorts to determine how wrong we were. We find that we are not alone in our sin. The average telephone layman cares nothing for these engineering niceties. He regards "stress" and "strain" as synonomous terms. Like the fellow whose wife's twin sister came to stay with them, he makes no attempt to differentiate.

You are invited . . . to tell TE&M authors your problems of department policy or procedure on which you'd like to have an opinion.

WHEN YOU HAVE TO RESTORE SERVICE FAST
ALPHADUCT ALPHA "C"
(1 Pair Parallel Distribution Wire 12 & 14 AWG Copper Covered Steel, 12 Gage Galvanized Steel)
■ Alphaduct is as close as your telephone
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THE WASHINGTON BEAT
By ROLAND DAVIES and FRED HFNCK

WASHINGTON OBSERVATIONS

Doerfer Resigns From FCC

THE RESIGNATION, under fire, of John C. Doerfer from the Federal Communications Commission removed from the regulatory agency the only one of its seven members currently in office who had received his appointment while serving on a state regulatory commission.

While the name of a successor to the deposed FCC chairman was anybody's guess at this writing, there appeared little likelihood that the appointee would come from one of the states, for a number of reasons. This leaves a void on the FCC as far as having as a member a person with background and experience in regard to telephone regulatory problems at the state level, as well as state-federal relationships through the medium of the National Association of Railroad & Utilities Commissioners.

The chairman of the FCC carries no more weight or power in voting than any of the other commissioners, but the holder of the top spot is more likely to have his views or philosophy reflected in staff actions and thus in commission policy that evovles from the day-by-day actions of the regulatory agency.

As a former member of the Wisconsin Public Service Commisison before his appointment as an FCC Commissioner in 1953, he became acquainted with state regulatory matters and, active in affairs of the NARUC, he was knowledgeable in such subjects as separations and toll compensation.

While the FCC was unanimous in its microwave policy decision of last summer, looking toward virtually unrestricted licensing of private microwave systems, it appears probable that, as a member of the Commission, Mr. Doerfer, because of his background, would give more weight to the view of the NARUC that the FCC should consider the impact on users of common carrier communications services in reconsidering its policy decision in this matter. The NARUC position was outlined by the association's President George R. Perrine in an exchange of correspondence with Mr. Doerfer last December.

With the departure of Mr. Doerfer, whose resignation climaxed calls for his departure in newspaper editorials and columns, and criticisms of his acceptance of a broadcaster's hospitality by a number of Congressmen, President Eisenhower immediately named Frederick W. Ford, a member of the FCC since August, 1957, to serve as chairman of the Commission.

The new FCC chairman served in the Justice Department for more than four years, in the capacity of assistant deputy attorney general in his last assignment there. Fifty years of age, he spent five years in private law practice in his native West Virginia before entering U. S. government service in 1939.

During his two-and-a-half year tenure as a Commissioner, Mr. Ford has demonstrated an approach to the job differing somewhat from some of his predecessors. His contacts with persons interested in the work of the Commission have been more formal than many of the earlier FCC members. At oral arguments before the FCC, he is usually the most frequent and persistent questioner of attorneys appearing before the bench.

It appeared probable at this writing that the White House would have some difficulty in finding a qualified successor to Mr. Doerfer, in view of the current situation surrounding the FCC (the Congressional hearings dealing with payola and "influence" that have the FCC as a principal target), and the fact that the unexpired portion of Mr. Doerfer's term runs only to June 30, 1961. Both the shortness of the term and the fact that a Presidential election will have taken place before it expires next year appeared to make the White House job of finding a successor more difficult.

FCC's Microwave Policy

ON THE SUBJECT of the FCC, and getting back to its microwave policy decision, the Commission's "stay" of processing of applications for various types of private microwave systems will remain in effect pending action on the petitions by communications common carriers for reconsideration of the policy decision, the Commission has announced.

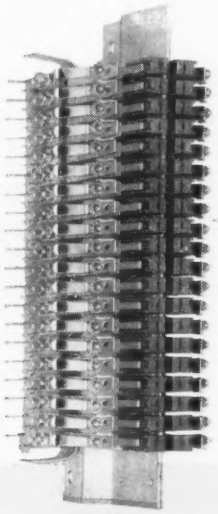
It said in a memorandum opinion that a number of pleadings seeking lifting of the "freeze" have not persuaded it that the policies enunciated last August should not continue to be "stayed."

Requests that the temporary stay of the policy decision be lifted, the Commission explained, had been submitted in various forms by the Minute Maid Corp., the Special Industrial Radio Services Association, the National Retail Merchants Association, the National

Please turn to page 21

MDF+3800
Means Economy

Do you know that more and more Cook (MDF) Main Distributing Frames are being installed in central offices throughout the world today because their *design simplicity* means *economy* where time, space and cost are important? Standardized unit construction permits greater flexibility in field assembly. These frames meet every requirement for termination of outside cable in central offices and for cross-connecting of lines, and . . .



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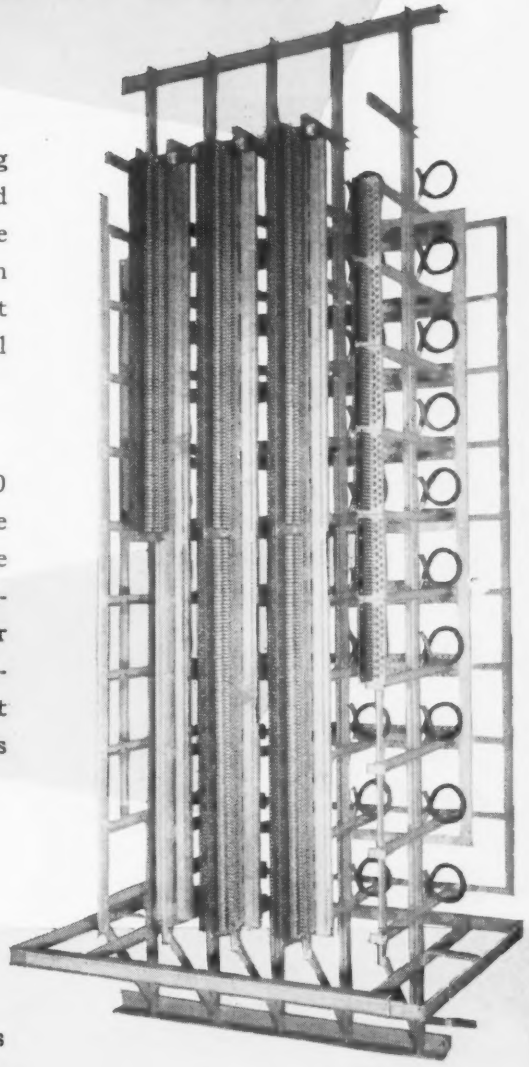
Do you know that Cook Type 3800 Central Office Protectors give the ultimate in dependable performance when installed on Cook Main Distributing Frames? They are used for cable termination and provide protection for central office equipment and personnel from high potentials and sneak currents.



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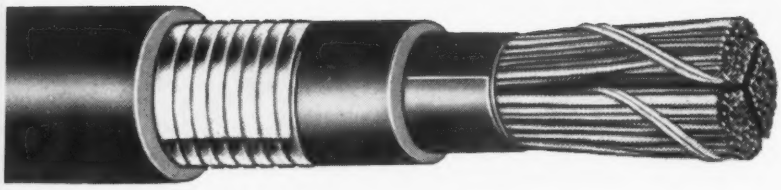

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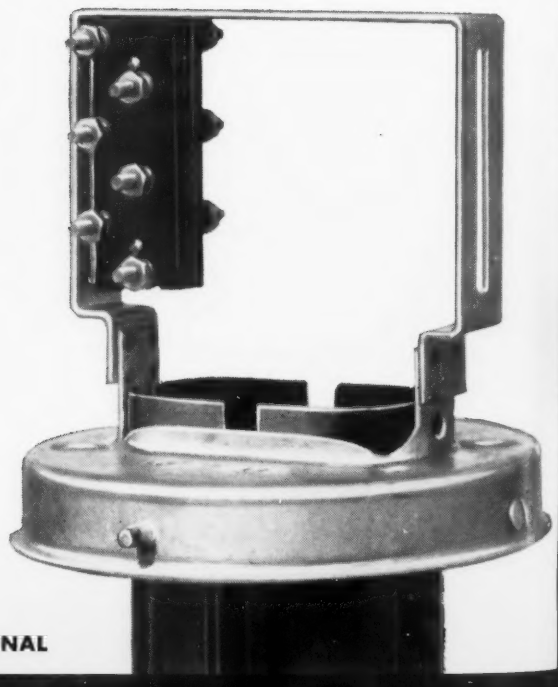

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DS ALPETH by General Cable handles easily, installs quickly! This double-polyethylene-sheath plastic insulated cable gives you extra mechanical protection. Available with aluminum or copper shielding. Ideal for direct burial installation. Manufactured in conductor sizes 26, 24, 22 and 19 AWG. Cables range from 6 to 400 pairs.

ALPHADUCT ARMORED UNDERGROUND DISTRIBUTING WIRE is available with rubber insulation and neoprene jacket or polyethylene insulation and jacket. Both types have flat steel ribbons wrapped around the insulated conductors. Polyethylene construction offers economy where conditions do not require the extra-rugged protection of rubber-neoprene.

TERMINALS provide accessibility to all cable pairs for testing, splicing, loading, protection, cross connecting and buried wire distribution. All-steel construction protects cable. Adaptable to pole mounting as well as underground installation. Your AE representative will be glad to give you further details.

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AE has all the supplies for your needs. You always get *prompt delivery* from a *large stock* of *famous brands*. Next time you need direct burial supplies, give us a call. We'll roll up our sleeves to prove that—at AE, you get all 3.

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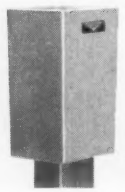
SUPERIOR

9 times 1ST. in Plastic Cables!

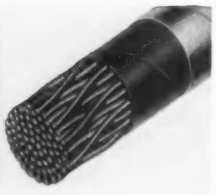
1st ... to invent a filled plastic splicing sleeve – Super-Splice.

1st in helping pioneer and develop the new buried plant concept.

1st to provide to the independent telephone field graded conductor insulation to more closely match the universal transmission standards for loading coils and terminating equipment.

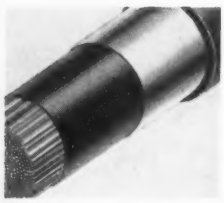


1st to develop new buried wire and new pedestal terminals.

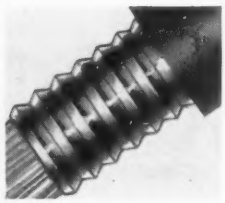


1st to use an irradiated core tape which more than doubled the dielectric strength of core tapes commonly used during that period.

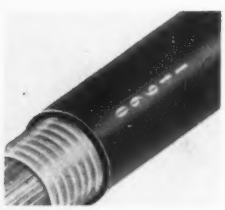
1st to incorporate linear type polyethylene for use in insulated wire products.



1st to manufacture cables for the independent field with a longitudinally applied shielding.



1st to fabricate and apply corrugated shielding on cable of all sizes.



1st to perfect the application of sequential foot-marking on wire and cable jackets.

Small wonder
SUPERIOR CABLES
are FIRST in QUALITY!

4495

SUPERIOR CABLE CORPORATION • Hickory, North Carolina

"WASHINGTON"

(Concluded from page 16)

Committee for Utilities Radio, the International Municipal Signal Association and International Association of Fire Chiefs, the Association of American Railroads, and the American Trucking Associations.

The Commission pointed to its statement of last October when it stayed the August decision to liberalize the licensing of private microwave systems, in which it declared that "in the interest of orderly development of actions . . . in the microwave field, a stay of temporary duration in implementations of the policies and determinations" made in the policy decision "would be desirable" while the petitions for reconsideration were being considered.

"Nothing offered (in the pleadings to lift the stay) constrains us to believe that a different finding must be made at this time," the Commission said.

The Defense Budget

THE COST to the U. S. Air Force for leasing commercial communications facilities should continue to rise for the next several years and then level off in fiscal 1964 or 1965 at somewhere between $400,000,000 and $450,000,000, an Air Force official predicated in testimony given to the House Appropriations subcommittee considering the Defense Department budget.

Maj. Gen. R. J. Friedman, Director of Budget, Comptroller of the Air Force, said he based his forecast on the fact that "Our rapidly changing force structures, featuring dispersal of our striking forces, demands ever-increasing reliance on secure, positive, and instantaneous communications. Major programs which, when fully implemented, will generate these increased costs are as follows: SAGE, communications in support of the Atlas, Titan, and Minuteman programs, Strategic Air Command primary alert and positive control systems, ballistic missile early warning system (BMEWS), communications in support of intelligence activities, and the combat logistics network (COMLOGNET)."

The testimony offered by Pentagon officials on the fiscal 1961 budget discloses that during the coming year the Defense Department anticipates that the costs of leasing commercial communications services and equipment will amount to over $178,00,000. This represents an increase of $48,000,000 over the level estimated for 1960, and $82,000,000 over the 1959 level.

"That Excise Tax"

AT THIS writing, four more bills to repeal the federal excise taxes on communications had been introduced in Congress to raise to 14 the number of such measures offered in the second session of the 86th Congress, added to the 91 bills offered in the first session dealing with repeal, reduction or termination of the levies.

The total number of bills offered this year includes two by Rep. Charles E. Goodell (R., N. Y.) which would end the federal telephone levy, but would clear the way for states or localities to begin imposing the tax, as previously reported. Rep. Goodell's bills are in accord with the plans of New York Governor Nelson Rockefeller in this field.

Countering statements by a number of other state Governors in support of Governor Rockefeller's program to have states and localities pick up the local telephone excise if it is terminated on schedule by the federal government June 30, Ohio Governor Michael V. DiSalle has been quoted as stating that he has no plans to ask the state General Assembly to reimpose the telephone tax if it is taken off at the federal level.

In one of the lengthier attacks on the federal impost yet brought out, Rep. A. S. Herlong, Jr. (D., Fla.) has inserted in the Congressional Record a statement against the tax which ran nearly a page. Rep. Herlong noted that regulatory commissions "have found it necessary to allow a net increase of $2.08 in gross revenues to allow an increase of $1 in the net income of a telephone company. This comes about as a result of the federal income tax.

"But, in addition, this cutomer must pay another 21 cents to cover the 10% excise tax on the increased rate. Thus, in order to increase a telephone company's net income by $1, the customer must bear a total increase of $2.29. Regulatory commissions are opposed to this added cost because they regard it as unsound, unjust, and inequitable to the maintenance of a reasonably priced communications service.

Telephone Co-ops Urge End of Federal Phone Excise

► ***Resolutions** calling for elimination of 10% federal excise on local telephone service, with no substitution of a state tax; participation by National Telephone Cooperative Association in future discussions by Bell System and Independent telephone companies on toll settlements; and setting aside of $50,000,000 in Rural Electrification Administration telephone loan funds for loans to co-ops in fiscal 1961, were adopted by NTCA at its annual convention in St. Louis.*

Co-op spokesmen also urged that improvements in toll settlements obtained by Independents in negotiations with Bell System be passed along to all connecting companies, including co-ops. Another resolution asked that per-subscriber charges for operator assistance be calculated on an individual company basis where two or more connecting companies in an extended service area obtain operator assistance from same organization.

In addition to hearing address by REA Administrator David A. Hamil those attending convention heard Senator Stuart Symington (D., Mo.) declare he will oppose any attempt to increase interest rate for REA loans.

LEICH'S *new look*

. . . Makes the best switchboard operator even better. . .

SEND FOR ATTRACTIVE NEW BROCHURE

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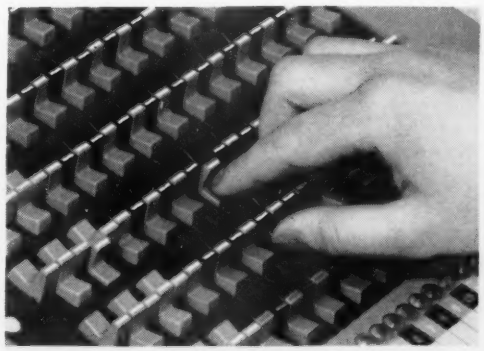
CORDLESS PBX

What a wonderful benefit to your subscribers! The Leich Cordless PBX makes the best switchboard operator in the business even better. The simplified color-coded keyboard makes her a shade faster on every call because of greater simplicity and automatic features. Also, any regular office girl can be quickly and easily taught to operate this modern, compact switchboard.

Leich's "new look" Cordless handles as many as 20 lines and offers other plus features such as night service, prompt recall, trunk holding and others. Just let subscribers see it and it sells itself!

You can give your subscribers excellent service on delivery because these Leich Cordless Switchboards are available from stock.

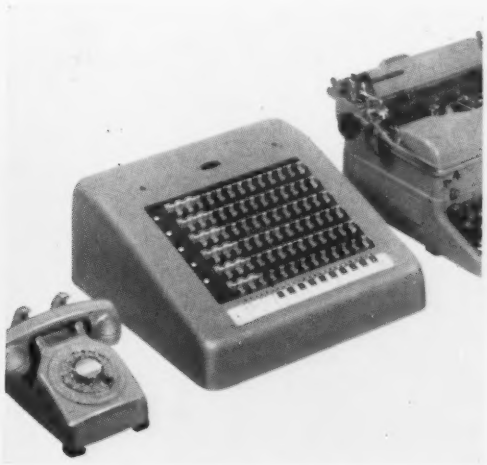


easy to operate

A novel arrangement of colored keys and low, sloping face permits fast, easy extension of calls without reaching or looking up. Keys are color-coded for greater visibility. Odd numbered station line keys are beige, even numbered black, trunk and operator keys gray.

What's more, each key has only one operative position. This eliminates the confusion of cam-type, two-way keys. To simplify operation further, alternate keys operate in opposite directions.

Supervisory lamps show when a party has disconnected, or is signaling. Busy lamps indicate stations and lines in use.



compact...modern

The Leich PBX is only slightly larger than a typewriter, 16½" long, 16" wide, 7½" high . . . and weighs only about 47 pounds.

It fits easily on the corner of a desk. Plenty of desk space remains for other office duties.

Leich's Cordless gives a new approach to styling. The neat lines and neutral gray finish of the cabinet make an attractive addition to any office. Its sloping face is similar to the latest business machines.

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ARE DEMANDS FOR EXTENDED SERVICE GIVING YOU HEADACHES ?

The low cost
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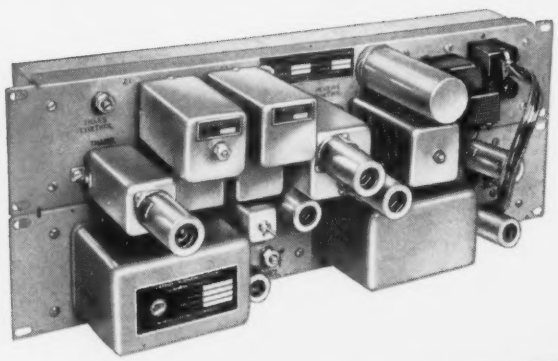
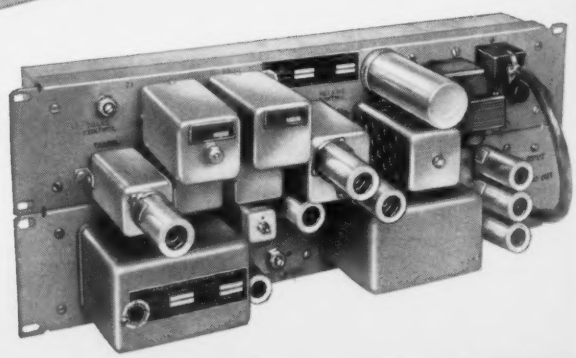
that will
cure
your problems
NOW!

Rx: NORTH CARRIER





If the demands for additional trunking facilities and added subscriber service keep you awake nights—if the potential expense of physical line construction has you over a barrel—NOW is the time to talk to your North Field Engineer. He can show you how North Carrier can solve your problems. North Trunk Carrier and North Subscriber Carrier have been designed and built specifically to meet the requirements of the Independent Operating Company.

Low in cost, simpler in circuitry for ease of maintenance, proven-in-use, North Carrier will enable you to extend your service without extending your physical lines.

Cure those headaches now—see your North Field Engineer or write for full details on North Carrier.

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Extruding equipment for applications of virgin high molecular weight polyethylene sheaths to Alpeth, DS-Alpeth and Stalpeth cables.

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General Cable thoroughly tests and evaluates its products from basic raw materials through final inspection. The result:

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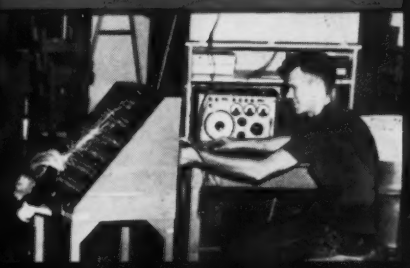
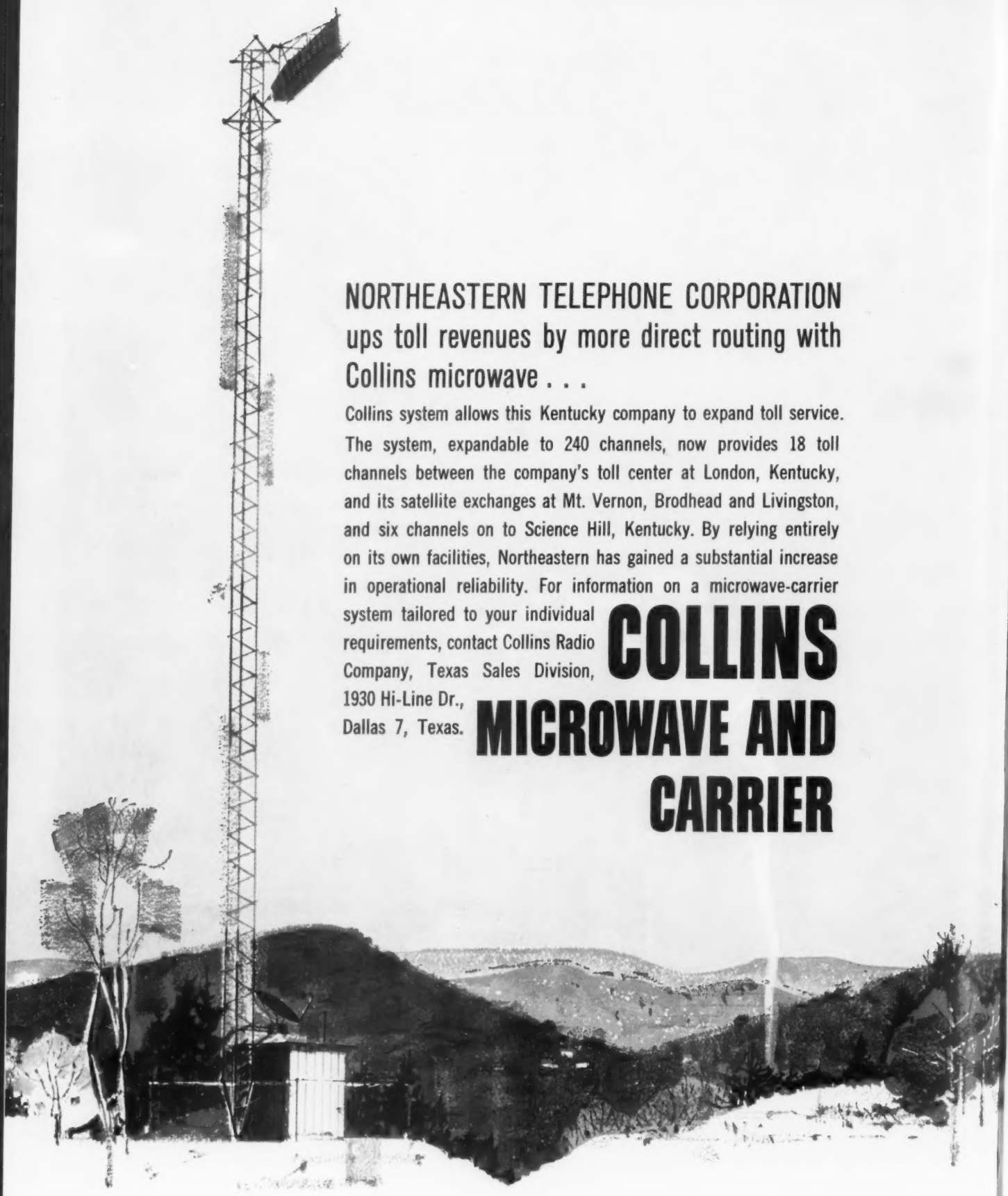
Chemical testing of compounds in the laboratories.

The recording device shown is part of the concentricity gage test set which controls sheath uniformity.

Physical testing of paper for tensile strength edge tear.

Final testing of telephone cable for capacitance unbalance.





NORTHEASTERN TELEPHONE CORPORATION ups toll revenues by more direct routing with Collins microwave . . .

Collins system allows this Kentucky company to expand toll service. The system, expandable to 240 channels, now provides 18 toll channels between the company's toll center at London, Kentucky, and its satellite exchanges at Mt. Vernon, Brodhead and Livingston, and six channels on to Science Hill, Kentucky. By relying entirely on its own facilities, Northeastern has gained a substantial increase in operational reliability. For information on a microwave-carrier system tailored to your individual requirements, contact Collins Radio Company, Texas Sales Division, 1930 Hi-Line Dr., Dallas 7, Texas.

COLLINS MICROWAVE AND CARRIER

COLLINS

COLLINS RADIO COMPANY • DALLAS, TEXAS • CEDAR RAPIDS, IOWA • BURBANK, CALIFORNIA

By MARION BEATTY

Member,
Kansas Corporation Commission,
Topeka, Kansas.

Principles of Regulation

PART TWO OF A SPECIAL TE&M ARTICLE

THE PUBLIC utility regulatory commissions regulate the industries which supply those utility services most essential to our daily lives, transportation, gas, power and light, telephone and water. The commission's rules, regulations and decisions affect the lives of everyone in the state. There are more utility ratepayers than there are taxpayers, if you exclude tax sales.

Railroads, power companies, gas companies, telephone companies and water companies are to some extent monopolies. They are somewhat different than other kinds of businesses. Utilities do not have the same kind of competition that your grocer has that keeps prices from skyrocketing. When a customer wants a telephone installed, he pays the price asked, he has no bargaining power and he can't shop around. Without this usual kind of competition, these utilities could charge whatever the traffic would bear, give good or poor service as they pleased, withhold service from some and quit whenever they pleased. An unregulated monopoly in control of light, heat, power, gas, water or any necessity of life could be intolerable.

Throughout part of the history of the telephone industry there was some competition. It is a matter of record that officers of the great Bell System concluded about 1910 that duplication of lines and service was so costly that its elimination and the substitution of government regulation was probably more desirable.

By regulation the state says to the telephone company

in effect, "We will certify to you a more or less exclusive territory in which to do business if you will supply the public adequate service day in and day out at nondiscriminatory rates which represent not more than a reasonable profit on your prudent investment. We will appoint the commission to review your tariffs, rules and practices, investigate any complaints and see that a fair relationship remains between the cost of services and prices charged."

Commissions and companies should strive to establish rates which will enable the maximum number of people to take advantage of utility services and at the same time maintain their companies in a state of financial soundness which will permit them to meet the new demands for service.

Commissions have a double duty to see that the utility serves the public convenience and necessity and on the other hand allows it an adequate rate so it can serve. It is fundamental law that we cannot compel a utility to serve at rates that are inadequate. The courts refer to this as confiscation. If we do so, the courts will slap the wrists of the commissions and set aside their decisions, holding them unreasonable and unlawful.

In some states the regulatory commissions prescribe rules and regulations covering all functions of a telephone company's activities. Kansas, for example, and some other states follow a different procedure inasmuch as it is felt that rules and regulations for the small company with few subscribers would not be applicable to the company serving several thousand subscribers.

Filings With the Commission

WHAT a telephone company is required to file with the commission, using the Kansas Commission for an example, may depict the sweep of its interest and to some extent the scope of commission jurisdiction. Each telephone company is required to submit to our Commission an annual report including much financial data. The report follows in form the annual report required by the Federal Communications Commission for Class A and B telephone companies. For the very small company, a less detailed annual report is required.

A uniform system of accounts is usually prescribed. Uniformity is necessary for interutility comparisons. The detailed accounts serve as a framework from which meaningful financial statements are prepared showing the condition of the company. Further detailed uniform accounts are most helpful as a means by which management, the regulatory body and the taxing arm of the government can analyze company transactions and from which trends and abnormalities may be observed.[3]

Each company must submit to the Commission for approval its general rules and regulations. These deal with the company relationship with subscribers or the public generally and cover such subjects as application for service, unauthorized attachments or connections, tampering with equipment, establishing and maintaining credit, description of what type of customer shall receive residential service and where the business rates should apply, the sharing of party-line telephone service, the company's collection policy and new line extension policy.

Every company is required to submit for Commission approval its local exchange tariffs, which cover such items as rates for business telephones, residential service rates and rural service rates.

In addition to that, if the company desires to charge for special services, it submits for approval a filing under general exchange service tariffs. These cover such items as monthly recurring charges for extension stations, extension gongs and bells, extra listings in the telephone directory, PBX stations, key operated telephones and colored telephones. They also include the nonrecurring charges which the company needs to make from time to time such as moves and changes, installation charges, connection charges and wiring charges.

It is a usual requirement that all services rendered by the telephone company which have a direct bearing on communication service, for which the company wishes to charge its subscribers, must be filed with and approved by the Commission.

The responsibility of seeing that all proper filings are made with the various commissions is a responsibility of management but may devolve upon the engineer.

When the Commission finds anything in these reports, or elsewhere, indicating an excessive return on rate base or on equity, unnecessary or improper expenditures or anything it considers out of line or prejudicial to the ratepaying public, it may initiate an investigation on its own motion and, following proper procedures, issue an order to correct the situation. Complaints of subscribers or the public against the utility are within the jurisdiction of the Commission to investigate and likewise correct.

Issuance of Securities

STATE control over the issuance of stock and the floating of debt by utilities appears to some to be undue injection of government into the field of business management. Be that as it may, the federal and state governments do exercise authority over these matters. More than half of the state commissions have authority to pass upon the issuance of securities, the incurring of debt by the utility as well as mergers, consolidations and reorganizations.

The capitalization of a business, particularly if it is overcapitalization, and the rate of interest paid upon its outstanding obligations directly affect its revenue requirements. A capital structure based on inflated values will appear to justify higher rate structures. It is settled as a matter of law that it is a proper function of state

law to protect, through its regulatory body, the ratepayer from the burdens attendant in overcapitalization.[4]

Certainly the utility will strive to earn something more than enough to cover operating expenses, the amount necessary to meet its obligations on debt and other fixed charges. If any of these are out of line so will be the rates to the consumer. The ratio of debt to equity may also have an effect upon the rate level and the stability of the enterprise. The utility's relationship and dealings with affiliate companies are also matters of legitimate public concern.

State laws, where they exist, usually limit the purpose for which utility securities may be issued, such as, for acquisition of property, the construction, completion, extension or improvement of facilities, for refunding of outstanding obligations or for the reimbursement of moneys expended from income.

Blue sky laws are designed to protect the public in the purchase of securities, whereas laws dealing with the issuance of securities by utilities are primarily designed to afford protection to the ratepaying pubic.

Popular Misconceptions

A FEW voters and a few public officials conceive the duty of a public utility commission to be that of conducting a running cold war with the utility companies. Where commissioners follow this practice, proper regulation suffers while a side show is conducted for the benefit of the ratepayers and voters.

One example: In Kansas the public utility commission is also the railroad commission and, among other duties, passes upon applications to discontinue trains, abandon stations or other services. An editorial in a small-town Kansas newspaper last year admitted that the Katy railroad would not be asking to close the local station if it were profitable, but urged the citizens to "march on the Commission one hundred strong and make themselves boisterously conspicuous." It should be obvious to the layman, and certainly to an editor, that we would have no regulation worthy of the name if decisions were based on how many persons marched on the commissions and made themselves boisterously conspicuous.

In some states, public utility commissioners are elected instead of appointed. It is not unheard of for a candidate for commissioner to make a campaign promise to reduce utility rates. We would not be favorably impressed with the qualifications of a candidate for judge who promised to convict someone before he heard the case.

The position of applicants, protestants and commission should be based on the over-all interest. The law and the whole theory of public utility regulation looks to the interest of the public as a whole. A rate case should not be a contest between warring selfish parties or a show ring for governors, commissioners, mayors or other public officials seeking to curry favor with the voters.

Their duty is not to harass these industries or to destroy the incentive that makes them possible. The commission's primary duty is to see that these utilities remain in business, consistently and regularly giving efficient and sufficient service to all who need it, on terms that are fair and nondiscriminatory and rates that are the lowest possible consistent with good management and rates which will provide a reasonable rate of return for those who have invested their money in the business.

This is no small task and to do it intelligently the commission needs competent help, accountants, engineers and attorneys. When a commission approves an application for a sizeable rate increase, it needs top-flight accountants to study the books and records of the

"The position of applicants, protestants and commission should be based on the over-all interest. The law and the whole theory of public regulation looks to the interest of the public as a whole."

company and to do a thorough job on the application. Some large commissions can afford to be competently staffed; others must employ special staff for important cases and some hobble along and fail to give the ratepayer proper and competent representation or protection.

It is also to the advantage of the telephone owners and managers to have state commissions competently staffed. When their life blood is at stake it is better to have experts wielding the butcher knives and scalpels. Management is less likely to be maimed or suffer the loss of essential parts of its anatomy.

The commission staff, and not the commission itself, can take the position of an adversary in rate hearings. The commission counsel should look to the interest of the ratepayer and represent him. Unless the staff attorneys act as people's counsel, the people may go unrepresented, for in many cases protestant ratepayers are not represented by experienced counsel or any counsel at all. — *To be continued.* (*Part One of this article appeared in the March* 15 *TE&M.*)

"These two Paystations average $148.14 per Month"

REPORTS H. H. RANDALL, GENERAL COMMERCIAL MANAGER, GENERAL TELEPHONE COMPANY OF MICHIGAN, MUSKEGON, MICHIGAN

Busy intersections and paystations go together like ham 'n eggs. In downtown Muskegon, Michigan, increased pedestrian and auto traffic had created several busy intersections. The telephone company did some surveying and decided that these intersections had high revenue potential. Paystations were set up—and they proved profitable. For example: the two paystations above average $148.14 per month.

Let us help you make paystations pay off in your town. Write for a *free* copy of our pocket-size Survey Simplifier. It helps you find paying locations for paystations. Write Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., Toronto 16.

H. H. Randall

PAYSTATION REVENUE FROM BOOTHS AT BUSY INTERSECTION, MUSKEGON, MICHIGAN

The two paystations at the above intersection totaled $1,777.75 for 12 months. One paystation brought in $919.55; the other, $858.20. Collections cover both local and toll revenue.

AUTOMATIC ELECTRIC

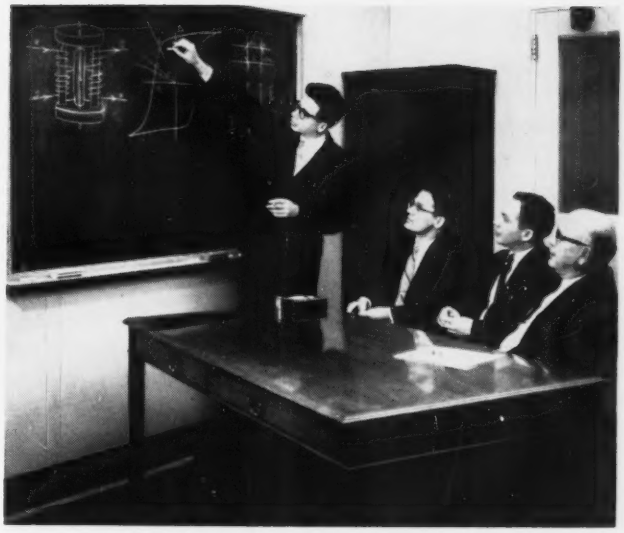
Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

Electronic Communications

OFF TO A GOOD START!

Thanks to the many readers who have written us regarding TE&M's new feature — "Electronic Communications." We appreciate your kind comments. And for those readers who have asked for a Home Study Course in "Electronics," we will start the course in an early issue as a regular part of the "Electronic Communications" section.



ALEX FEINER at the blackboard discusses the conceptual principles of the ferreed with, left to right, P. G. RIDINGER, T. N. LOWRY, and C. A. LOVELL of Bell Telephone Laboratories' technical staff. The ferreed was invented by the four engineers pictured.

The Ferreed: Microsecond Memory Drives Metallic Contacts

AT WHIPPANY, N. J., a team of engineers has invented a very fast electromechanical switch called the "ferreed." It utilizes a new technique for actuation which is compatible in speed with electronic circuits.

The ferreed may find use as an interconnecting element in telephone switching networks, where it could be controlled a thousand times more rapidly than switches presently employed.

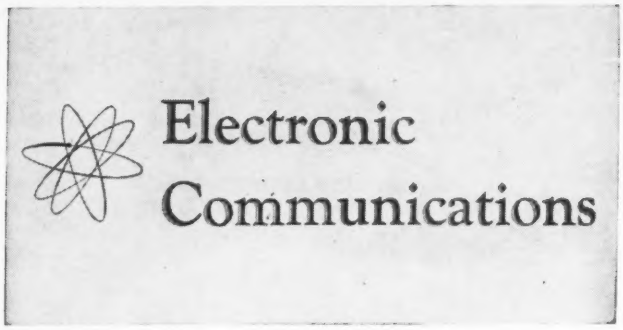
Inventors of the new switch, *A. Feiner, C. A. Lovell, T. N. Lowry,* and *P. G. Ridinger,* are members of the technical staff of *Bell Telephone Laboratories.* They anticipate applications for the ferreed in various types of systems where advantage may be taken of metallic contacts controllable by current pulses of a few microseconds duration.

Magnetic materials that can be quickly switched between two alternate states have been widely used as "memories" for storing information in digital computers. The useful output from these elements has generally been limited, however, to electrical signals of a transistory character.

In conventional electromagnetic relays, on the other hand, continuous electrical currents can be used to open and close metallic contacts for extended periods of time, but at speeds limited by the mechanical motion of the moving parts.

The ferreed combines the rapid switching of bistable magnetic material with metallic contacts for output indications that persist as long as desired without further application of power. In several models of the device, a cobalt ferrite has been used as the magnetic material and a glass-sealed magnetic reed switch for the output contacts — hence the name, "ferreed."

In operation, the magnetic material is switched by a magnetomotive force applied, typically, as a five-ampere current pulse in a thirty-turn winding. Control pulses as short as five microseconds will switch the



(Continued from page 33)

magnetic material, resulting in the passage of magnetic flux through the movable members of the reed switch. Actual closure of the contacts is delayed by inertia of the reeds for several hundred microseconds.

Release of the contacts is brought about by cancellation of the magnetic flux through the reeds, as the result of another five-microsecond switching operation. Opening of the contacts requires less time than the closing operation.

Several new magnetic materials have been synthesized for use in developmental models of the ferreed. Among these are ferrites exhibiting characteristics midway between permanent magnets and computer memory materials, and ferrite suspensions in plastic, "tailor-made" for specific magnetic, electrical, and mechanical properties. The reed switch is similar to a type used in standard electromagnetic relays for the past decade.

In a telephone switching network, subscribers are interconnected by the closure, in specified patterns, of switches called "crosspoints." A typical central telephone office contains many thousands of these switches; of these, a few dozen are operated for each call. Those crosspoints required for a particular connection must be selected by the coincidence of pairs of control pulses. The ferreed's magnetic structure responds to a pair of pulses by closing the output contacts. They are opened by a subsequent single pulse.

Besides coincident pulse operation and rapid actuation, the magnetic structure permits the desired switching by current pulses of widely variable character.

The result, when ferreeds are used in switching networks, is reliable operation from simple control circuits.

North Electric Awarded 412-L Electronic Switching Contract

WILLIAM TUCKER, president of North Electric Co., Galion, Ohio, has announced the award of a contract by General Electric Co. to North Electric for the design and manufacture of mobile and fixed electronic communications and switching centers for the 412-L project of the United States Air Force. According to Mr. Tucker this is the largest electronic switching equipment production contract, either military or commercial, ever awarded anywhere in the world. The value of the contract was not released but it is understood to be in excess of several million dollars.

The over-all 412-L system is a ground environment complex containing major radars, data processing, communications and other special types of equipments. North Electric's contribution to the development of this Air Weapons Control System consists of advanced electronic switching techniques capable of providing communications and control for a wide variety of defensive and offensive weapons to answer needs of air space management outside the continental United States.

President Tucker stated that North Electric's concept introduces many unique solid-state switching techniques to the swiching art.

"The announcement," he said, "unwraps a major technological breakthrough in electronic switching. North Electric has combined known Time Division 'Highway' switching principles with a unique 'Resonant Transfer' technique to overcome the inherent disadvantages long associated with Space Division systems as far as the quantity of switching contacts (transistors) in the transmission path is concerned. Other existing electronic switching systems to date are also known to require from 16 to 20 contacts per line while this new approach requires approximately 1.3 contacts per line as applied to large commercial offices. The increase in reliability plus the reduction in space and cost requirements are obvious."

Mr. Tucker stated the reduction in contacts per line is possible since the transmission medium is time-shared.

"This transmission means," he said, "is a single common conductor or 'Highway' to which every line can be gated through individual pulse contacts and filters. Transmission between lines is established by closing the respective contacts instantaneously in synchronism for a very short period of time. Thus, signal pulses are generated in the order of a few microseconds duration. For transmission of a normal frequency band, the pulse repetition frequency is of the order of 10 kc/s. These transmission pulse trains are amplitude-modulated by this low-frequency signal.

"Until the new design, detection of this pulse train was effected thusly: The low frequency component was fed to the load and the sidebands of the pulse frequency and its harmonics were cut off by means of a low-pass filter. A considerable part of the signal power of the pulses, was, however, lost, and therefore the efficiency of the detection was low. This had been a serious drawback in electronic switching."

According to President Tucker a satisfactory solution from a transmission loss, space point, and cost standpoint was developed by using a series-resonant circuit for the pulse forming network, where the capacitor also serves as the terminating capacitor of the filter. Half sine-wave pulses are generated if the closure time of the switches is adjusted to exactly one-half-cycle of the resonant circuits. During the half-cycle, the charge in the capacitor at one filter will swing over to the capacitor at the other filter and vice versa with very little loss.

This patented principle, identified as "Resonant Transfer," was first conceived in 1952 by Gunnar Svala, North Electric's director of research, and his associates. Commercial and military application of this principle has been somewhat limited until this announcement.

Tucker reported that North's new Time Division Multiplex Electronic Switching System provides many new switching advantages.

"By utilizing a common control marker, register-sender-translator principle," he said, "provision is made for a universal numbering plan with alternate routing. Under this completely uniform numbering plan all offices became part of a single multi-office area numbering scheme. The system is, moreover, so flexible that interoperation with any other telephone network can be easily arranged."

Pointing out that with stations sharing individual, yet changeable, time slots in the interconnected "highways," components and circuits are kept to a minimum for improved reliability at less cost, Tucker stated, "The highway switching scheme, similar to the crossbar switching group principle, keeps the transmission path as simple as possible and reduces delay distortion and equipment in the world today."

"Other features," he stated, "include complete four-wire through-switching with speeds in milliseconds to accommodate both data and voice transmission, as well as 'pushbutton dialing' at each station. Utilizing plug-in modular design, the system is ideal for tactical mobile as well as fixed installations. It is fully compatible with any existing commercial or military communications equipment in the world today."

Collins Radio Transmits 500,000 Punched Cards In Chrysler Test

FIRST ON-THE-SITE industrial demonstration of a high-speed digital data communications system was successfully completed recently when Collins Radio Company's Western Division, Burbank, Calif., transmitted more than 500,000 punched cards at the rate of 100 per minute over a telephone line for the Chrysler Corp.

The Chrysler card transmission circuit linked the automaker's general offices in Highland Park. Mich. with the Dodge main plant in Hamtramck. Mich. Purpose of the demonstration was to show application of Collins Kineplex data communications systems in industrial and business data processing. Kineplex systems have been operating between military and government data processing and communications centers for years.

Collins recently concluded a similar demonstration for the Veterans Administration during which more than 350,000 cards representing actual insurance premium notices were transmitted between St. Paul, Minn. and Philadelphia, Pa. over telephone lines.

Chrysler officials said the Collins data communications system was being evaluated in line with their increasing computer and data processing requirements and the need for accurate, high-speed transmission of data between their various plants and offices.

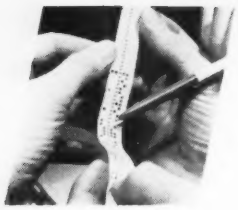
Collins Kineplex punched card transmission system shown here was demonstrated for Chrysler officials during recent nine-day test run. More than 500,000 computer programming, payroll accounting and parts inventory control cards were transmitted between two Chrysler facilities over a telephone line. Chrysler is evaluating Collins data communications system because of increasing need for high-speed, high-capacity data communications between data processing and computing centers. Kineplex systems are development of Collins Radio Co., Western Division, Burbank, Calif.

During the nine-day demonstration at Chrysler, the Kineplex system operated in full duplex mode, with cards transmitted and received in both directions simultaneously. The Collins system transmits 100 cards per minute in each direction. Binary-punched computer program cards as well as payroll accounting and parts inventory control cards were transmitted for Chrysler observers.

In operation, the Collins Kineplex system reads the cards, converts the punched information to audio signals and transmits them over telephone or radio circuits. At the other end of the line receiving equipment converts the signals back to punched card form.

R. L. Ericson, Collins Western Division sales director, pointed out that Kineplex card and tape transmission systems utilize ordinary telephone or radio voice channels. In most cases, he said, no special communications links are required since existing facilities can be used. Transmission distances are virtually unlimited, he added.

A NEW Home Study Course in "Electronic Communications" is being prepared by the TE&M Educational Division. It will start in an early issue of TELEPHONE ENGINEER AND MANAGEMENT. Since the training course will not be reprinted, we suggest that you enter your personal subscription to TE&M today. Use order blank on page 61.



"TRAFFIC LIGHTS" By D. A. PERIGO

Your Absence Control Program

Traffic absence falls into three classifications — (1) Incidental; (2) disability and leave of absence; and (3) miscellaneous time off. Of the three, incidental absence causes the biggest problem!

ABSENTEEISM is a cost item in any business. In the Traffic Department of the telephone company, however, absence can become unusually expensive. Again we point out that in the other departments the work is assigned to the people, whereas in a central office, people are assigned to the expected work.

Generally speaking, the assignment of hours of work for operators is posted by Wednesday of the preceding week. Depending on the size of the office this often means that work assignments are made more than a week in advance. A great many companies are affected by a Labor Contract which governs the conditions under which changes can be made. There are also laws concerning the hours and working conditions of females.

The Traffic Department must, however, maintain its service objectives. The company's reputation is always at stake in this connection — so decisions must be made about each absence. If traffic is lower than expected a call-in may not be necessary — but this is seldom the case.

The usual methods of classifying Traffic absence are:

(1) *Incidental* — representing absence of less than a week due to illness, to home conditions, and no report.

(2) *Disability and Leave of Absence* — representing illness of over one week, on duty accidents, and other Leaves of Absence.

(3) *Miscellaneous Time Off* — representing granted time off and "no hours available."

Of these three classes the first one — *Incidental Absence* — is the one which causes the most headaches, because the latter two can, at least, be prepared for, but the first one hits us Boom — right now!

"A Difficult Problem"

HAVE YOU ever heard a Chief Operator say something like this? "I can't win. We were averaging two absences a day, our traffic was high, and it was costing us overtime every day. I scheduled two additional shifts so there wouldn't be any overtime involved. What happened? Nobody was absent — and our traffic dropped."

We can feel sorry for this Chief Operator, particularly because she was trying her darndest to maintain her service at a reasonable cost.

There is no question but what some absence is justified because of illness, death in the family, or other unfortunate things — but, by and large, there are other basic reasons for absenteeism which can be controlled.

Maybe some of this problem is caused by a failure to appreciate what happens to the company (and all things affecting the company finally affect the individual). Just as an example, an operator considers it wrong to destroy, or steal, a 25-cent toll ticket — but she does not understand the fact that when she is unnecessarily absent and has to be replaced on an overtime basis that she is *robbing* the company of $4. to $8. just to pay for the unnecessary overtime.

For the sake of illustration let's assume you have a 5 per cent Incidental Absence rate. This means that one operator of every 20 assigned to work is absent. It means that if you have 40 operators assigned there are two absentees — with 100 there are five, and with 500 there are 25 absentees. Maybe you have people available for call-in — if so, consider yourself very fortunate! — but remember it took time to get a replacement, time that might have been used to better advantage.

The "Absence Calendar"

ONE OF the places where that time can be used is in trying to control such absence. We recommend an "Absence Calendar" (our respects to the Bell System "Central Office Management" circular). This is merely a three-year calendar on which absence is encircled, and is a part of the "Employe Development Record" which was discussed in the March 15, 1960 issue of *Telephone Engineer & Management. Do not keep it just as a nice record — use it!* Make sure you also know the reasons for each absence — and that you counsel each employe.

Health is, of course, a big factor — but let's face it — some people seem to *enjoy* poor health as an excuse for all of their shortcomings. Do the employes a favor, as well as yourself,

and convince them of what a wonderful feeling they will have when they use their jobs as a means of forgetting personal problems and the minor illnesses they cause.

We believe a great deal of incidental absence is due to *attitude* and this is the greatest spot to make economic improvement. The point to start on this item is before hiring — when the young high school graduate *wants a job.*

It can't stop there, because as soon as she starts to work she is thrown in with those members of the force who believe the world owes them a living during the hours they are willing to be on duty. This means the Chief Operator and Supervisors must be stronger than the other employes so as to carry the new employe past the temptations placed there by the older ones. Certainly there is no need to remind anyone to work on the present employes too.

We will pass over the second classification without comment here — but in the third is an item — "*No hours available*" — which has some meaning. If you read "Traffic Lights" in the January 1, 1960 issue of *Telephone Engineer & Management* and noted the comments about vacations you will see a tie-in. Properly-scheduled vacations provide a means for reducing absence due to "No hours available" by taking vacations from peak traffic periods of the year and scheduling them during periods when the traffic is down.

The costs of absence are substantial, and while the amounts may appear as negligible in a small company, percentagewise they may be even more significant than in a larger company. If you saw one of your operators throwing your nickels into the river you would take some action. Why not take some action when she is wasting dollars for you through absence?

We think you can afford to spend some time trying to solve this problem. We could expound at great length on the subject without accomplishing very much. It is one which differs among companies — and even among offices of the same company. We are convinced that the degree of the problem is directly related to the office supervision. It is almost a sure bet that if you have incidental absence problems, you have other problems in the same office.

We believe the problem can be solved by building a desire among our traffic people to be present and work the hours assigned. There is an old story that emphasizes this: —

When transportation was tied up due to a heavy storm a man and a girl were plodding through the snow. The man decided to return home and conduct his business by telephone and suggested the girl do the same. Her reply was, "There will probably be a lot of people using their telephones today so I must go on. I'm a telephone operator."

A revitalizing of this attitude will reduce the expenses due to absence. — *D. A. Perigo.*

Battery Eliminators

CATALOG from Schauer Mfg. Co. describes complete line of battery eliminators and battery chargers, designed for telephone service.

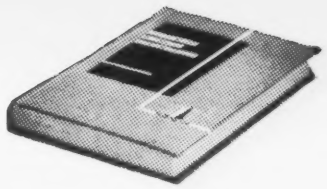
Catalog gives data on (1) Battery eliminators for small common battery systems; (2) constant voltage battery eliminators for lamp signal and dial switchboards; (3) the Type RB charger that automatically maintains the terminal voltage of a set of batteries at a relatively constant value regardless of load conditions; (4) the Type G trickle charger for small common battery exchanges; (5) a battery eliminator designed to replace dry cells in magneto telephones.

To obtain your free copy, write *Schauer Manufacturing Corp.*, 4516 *Alpine Ave., Cincinnati* 42, *Ohio.*

Battery Charging Equipment

CATALOG from Schauer Manufacturing Corp. describes complete line of Schauer automatic products, including home-type battery chargers, quick-chargers, garage chargers, and automotive test instruments.

For your free copy write *Schauer Manufacturing Corp.*, 4516 *Alpine Ave., Cincinnati* 42, *Ohio.*



Save time and work in engineering design

Just Published! Here's a practical manual of tested product-engineering aids to help you get quicker, easier solutions to everyday work problems. It offers a ready-made file of methods, formulas, tables, and charts for engineering top efficiency into devices, components, or complete products. Covers a full range of topics, from accessories and assemblies to clutches, control devices, electrical components, etc. Includes such modern developments as ultrasonics and automated assembly. *Over 1100 drawings show vital design details.*

PRODUCT ENGINEERING DESIGN MANUAL

Edited by Douglas C. Greenwood

Editor, Product Engineering Design Digest

342 pp., 8½ x 11, over 1100 illus., $9.

The book provides a storehouse of material to stimulate you to new design ingenuity, and to help you gain improved mechanisms, better assembly methods, and savings in materials and time. Over 100 topics are systematically arranged and illustrated. You can see how each device works, what it does, and how it meets design requirements. Thus, the book gives you the "feel" of a problem by showing in detail what is good, what has been done, and what is acceptable.

Gives up-to-date facts and data on resistors

Just Published! This book thoroughly covers fundamentals and needed data in the use of resistors in electronic design. You get groundwork in the basic aspects of resistance and descriptions of each type of resistor, the materials used in its manufacture, and characteristics associated with each type. Comprehensive tables give most manufacturers' data, with specific types of resistors covered in common tables. Thus, a design or components engineer can easily determine the scope of what is available. Full attention is given to such important areas as reliability in resistors, measurements, etc.

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By Charles L. Wellard

Technical Director, Clifton Precision Products Co.

264 pp., 6 x 8, 82 illus., $8.50

Among the book's many special features you will find a detailed treatment of precision films as a replacement of wirewound resistors. Included, too, is information on the preparation of precision films by pyrolysis, evaporation, and reduction of oxides. Numerous charts and graphs present information that heretofore has seldom been readily available regarding the power and voltage ratings of resistors, the varieties of material used in their construction, and their many industrial applications.

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During April a Bell System advertisement will be in full flower—and full color—in 16 of the country's most widely read magazines (see box below).

Its aim: to sell extension telephones in color.

Commercials on the same theme will be aired on coast-to-coast television during the April 1st Bell Telephone Hour. These commercials, and the ad, will reach millions of people—customers of every telephone company.

And at a good time of the year, too. For spring is when folks get an urge to brighten up their homes and live a little easier. What better way to do both than by ordering convenient, colorful extension phones? They save time and steps while adding touches of beauty throughout the home.

And what better way can the telephone industry improve its sales and please its customers than by offering better telephone service at a reasonable price?

Some of your favorite magazines may be on this list of those that are carrying the Bell System April advertisement entitled, "Pick a phone from this garden of colors":

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BELL TELEPHONE SYSTEM

"SUB-HARMONICS and OVERTONES"
By C. D. EHINGER

The "Kid's" Boss Starts An Article

It was one of those days. Article ideas were scarce. It was difficult to get down to the business of writing an article, until the "Kid's" boss opened his dictionary and checked on the definition of "Deduce." From then on things happened — but the article was never written.

H'mm — Come on Ehinger. You'll have to set to work and get some of these articles written. John Reynolds has been writing a few notes and intimating that it might be a little helpful if you would get farther ahead on your schedule. — — OK! OK! Why don't you just buckle down and have three or four months of work finished and in to him? — — So, Ehinger — get going! Clear a space on the bench and set up the dictating machine!

By golly, Ehinger, your workshop is beginning to be worse than Fibber McGee's closet. Twenty-five feet of workbench space and over 100 feet of shelf space and things are overflowing with electronic gear, ham equipment, manufacturers' equipment for testing and checking, reference books, and tools. What's that old saying — "cluttered desk, cluttered mind."

Thinking of the mind — I wonder if an article could be worked up along that line. What about all those years in the Great Books courses? Plenty of material for articles there! They certainly opened up my mind to a much greater appreciation of the actual need for philosophers.

Most certainly, the usual engineering courses are so preoccupied in cramming down math, physics, circuits, application, and design, there is practically no time or effort expended in the study of the work of some of the great philosophers.

Yet, Aristotle and Plato and Aquinas and Augustine and even Kant and James and many others certainly had a lot to do with science getting on the right trail toward understanding the secrets of Nature. Which one was it who wondered whether there were holes in the Universe or whether it consisted of a *continuum* of space? And didn't that actually precede a lot of the thinking that is only coming to a focus today?

Maybe some of those old fellows, of hundreds and thousands of years ago, were much more modern than I give them credit for. Which one was it who went so heavily into inductive and deductive reasoning? Maybe I could work up an article on deductive reasoning and how all of us do it unknowingly.

"Buckle Down To Work"

OH, COME ON now, Ehinger — you're just horsing around and doodling away on anything to keep from buckling down to work and writing an article concerning some of the everyday equipment used in the telephone business. But — it is sort of fun to just daydream and think about things that aren't so prosaic. Wonder what the dictionary gives on "deduction."

Let's see now: — DEDUCT — (*see deduce*).

H'mm — let's look at — DEDUCE — "(1) *To trace the course of; as to deduce one's descent;* (2) *To derive by reasoning; spec.: logic; to infer by deduction; reasoning from the general to the particular, or from the universal to the individual, or, spec.: from given premises to their necessary conclusion; also, the conclusion so reached.*"

W-e-e-l-l, where could you go from here, Ehinger, on deducing something? By golly, it was hard to see the writing in that dictionary — why don't you turn on some more light? Funny how much work seems to be going on today in trying to understand light and what it is and what it means. Some bird is even proposing photon emission as a means of propelling space vehicles in the near future.

Let's see, now — what did my physics book in college say about light? — Hold on, no use to look at that, it's 25 years old and our information and knowledge of Nature has changed so much since then that this book's only value is to show us what we *thought* was true *then* instead of acting as a reference book.

"An Up-to-Date Reference"

WELL, what can I pull out of the bookshelf that is up-to-date? Let's see, now — Ah, yeah! Here is "Industrial Electronics Handbook" — by Cottrell, which seems to be valuable for any kind of reference. — Yep, here it is! Under "Light and Optics":

"*Light — light is a form of radiant energy emitted in quanta and Propagated by electro-magnetic waves. The vibration is considered a transverse wave whose velocity is approximately* 186,284 *m.p.s. in*

vacuum. The velocity is less in all transparent media other than vacuum."

We seem to be constantly coming back to light as a basic "building block" in all our computations involving anything concerning Nature, which, of course, encompasses physics, chemistry, atomic structure, radiation — the works!

But, if light is propagated by electromagnetic waves, then it certainly must follow a good many of the behavior patterns which are followed by ordinary electrical phenomena. I wonder if I could scare up a few quick examples that show somewhat comparable characteristics. Let's see — if I have a camera lens whose focal length is f_1 and place another positive supplementary lens of focal length f_2 in front of the camera lens, I can calculate the focal length F of the combination by the formula:

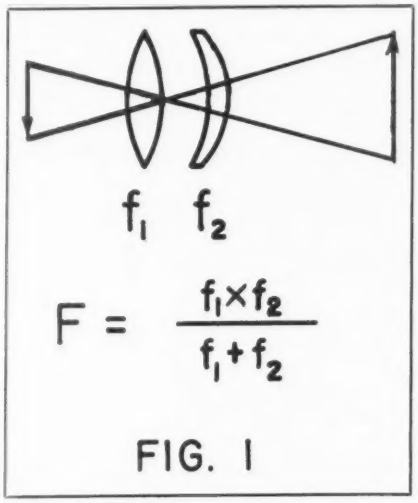

FIG. 1

Now, if I take two resistances and place them in parallel I can find the combination of the resistances by the formula:

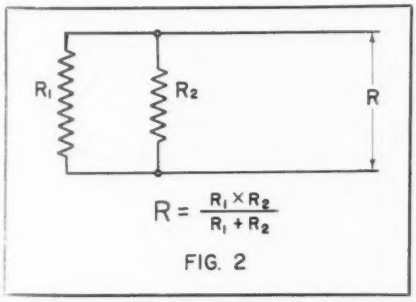

FIG. 2

That certainly looks like an exact corollary! Is a lens actually a resistance? Could be — after all, resistance in ohms multiplied by capacity in farads equals time, in seconds! That is certainly more strange than a concept of a lens being resistance at the frequency of light!

COMING NEXT ISSUE

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how to obtain it by
RICHARD ALLEN

A SPOT NEWS ANNOUNCER
how to build one by
C. D. EHINGER

"Other Properties Of Light"

LET'S SEE, what are some of the other properties of light which follow the same path, or seem to correspond to other electrical properties?

Well, of course, we are familiar with the fact that high frequency radio waves begin to exhibit some of the properties of light. It almost *has* to be that radio and audio frequency waves are at least first cousins to light — only lower in the frequency spectrum.

We are operating radio in the 10,000 megacycle and higher range, which means wave lengths which are a fraction of a centimeter in length. Let's see, now, this compares to visible light which has wave lengths from 400 to 760 millimicrons, which are thousandths of a millionth of a meter, so the average frequency of visible light is only 6000 times as rapid as some of our highest frequency radio waves we use in our microwave equipment.

And how does all this tie in, if it does, with Einstein's fairly well accepted equation which states that the kinetic energy (E_k) of any mass (m) traveling with a velocity (v) can be expressed:

$$E_k = \frac{m\,c^2}{\sqrt{1 - \frac{v^2}{c^3}}}$$

"Something That Is Cannot Be"

SINCE *c* is the velocity of light, it is easy to see that if the mass approaches the velocity of light, the quantity under the radical approaches zero and the kinetic energy approaches infinity. Therefore, the conclusions are drawn that it is impossible for any object to approach the velocity of light, yet it has been proven that light has mass and, most certainly, light has the velocity of light, so it would almost seem that we were saying that something that *is* cannot *be*.

Oh, come on, Ehinger, get off it! That line of reasoning doesn't deduct or deduce anything. *Yet*, maybe it would show how some of the thought processes are used in attempting to move from one step of logic to another step and to a final conclusion. Nope, I'm afraid it wouldn't — there're too many holes and gaps for that line of reasoning to show anything. Now stop your daydreaming and get down to work! — *C. D. Ehinger.*

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Any comments, criticisms, or suggestions for future topics? Address all correspondence to "Sub-Harmonics and Overtones," Telephone Engineer and Management, 7720 Sheridan Road, Chicago 26, Ill.

ACCOUNTING DEPARTMENT NOTES
By G. M. JONES

V: Depreciation Theory And Practice

All of the proposals that would permit corporations to adjust reported income for the effect of price-level changes aim at letting the companies be relieved of federal income taxes in an amount based on the difference between original cost depreciation and some desirable larger amount. (Continued from the Feb. 1 issue.)

A NUMBER of ways have been suggested to permit corporations to adjust reported income for the effect of price-level changes. Since the principal concern of businesses is the provision of capital for the replacement of facilities, modernization and expansion, all the proposals aim at letting companies be relieved of federal income taxes in an amount based on the difference between original-cost depreciation and some desirable larger amount.

At least four ways to do this have been suggested:

(1) Conversion of depreciation charges by index.

(2) Adjustment of depreciation allowance to date, plus subsequent economic depreciation.

(3) Deduction of accumulated depreciation deficiency at time of retirement and reinvestment.

(4) Deduction of accumulated depreciation deficiency at retirement and reinvestment, with reduction of new-asset cost basis.

Conversion Of Original-Cost Depreciation Charges By Index

THIS is the method of price-level adjustment recommended by the USITA accounting committee in 1958, and is the method which has been advocated most frequently over quite a period of years. In theory, it is a simple idea; for any given year one would simply multiply the usual depreciation charges by the change in some appropriate index to get the amount of "economic" depreciation to be recognized for that period.

For example, consider a piece of equipment costing $10,000 having an expected life of 10 years. The index being used for adjustment in successive years, and the effects of adjustment, are shown in *Exhibit One*.

It is evident that the accumulated depreciation charges, even on this price-level adjusted basis, do not really make much headway toward providing a renewal of the capacity represented by the unit which presumably is to be retired at the end of the tenth year.

The probable replacement cost (not necessarily in kind, but in equivalent assets) would be around $10,000 × 119.2% or $11,920. The application of an index adjustment over asset life provides only the opportunity to save having to pay taxes on $642 of extra depreciation, which would mean that the net effect is an opportunity to retain some $334 over and above that indicated by original-cost depreciation. The remaining capital needed must be provided either by increased selling prices over the ten-year period or by an infusion of new capital.

It would appear, then, that economic depreciation via the index method may not be the happy solution that it first appears to be.

You are invited . . . to tell our authors about problems on which you'd like to have an opinion.

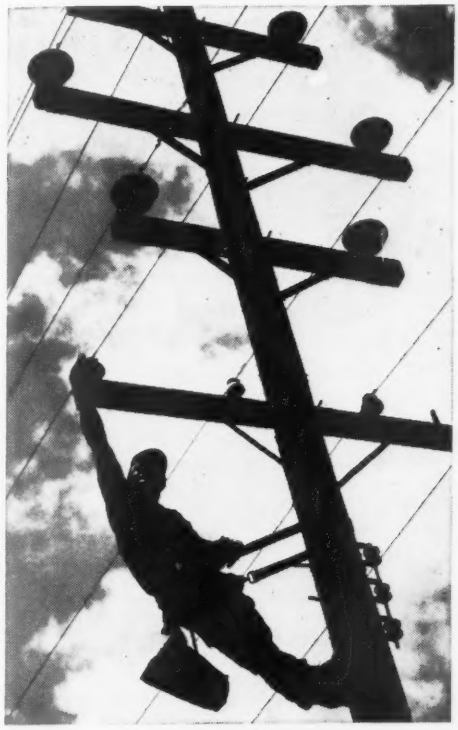
No one has decided as yet just what index series should be used for adjustment. No matter what index is chosen, it is sure to be a misfit as far as some individual companies are concerned. The Consumers Price Index, for instance, is a poor indicator of changes in the cost of technical equipment. Some indices of building costs are suitable for adjusting costs of some telephone company facilities — but how relevant are they for price changes in microwave or switching equipment? *Turn to page 44*

Exhibit One
Effects of Index Adjustment of Depreciation

Year	Straight-line Depreciation on Cost	Index	Current Index as a % of Purchase-year Index	Economic Depreciation
1	$ 1,000	104	100.	$ 1,000
2	1,000	106	101.9	1,019
3	1,000	108	103.8	1,038
4	1,000	107	102.9	1,029
5	1,000	106	101.9	1,019
6	1,000	108	103.8	1,038
7	1,000	112	107.7	1,077
8	1,000	114	109.6	1,096
9	1,000	118	113.4	1,134
10	1,000	124	119.2	1,192
Total recovery	$10,000			$10,642

Cost of renewing equivalent productive capacity at end of 10th year. $11,920.

How can you string telephone lines faster?



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- Severe weather conditions will not damage it. Heavy ice may weight it down, but will not break it.
- Existing rural power poles may be used to string telephone lines without need for additional supporting poles.

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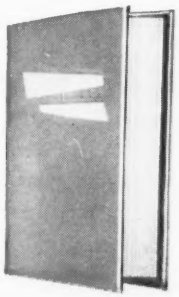

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It is apparent that no one universal index would suffice for all purposes; yet if an index method is adopted, the Treasury practically must insist on a universal index; otherwise the proposition would unleash a Pandora's box of dilemmas in interpretation and administration, costly both to the Treasury and to the companies seeking relief through provisions of the act. Some commentators have eased past the question by saying that the Treasury should provide some proper index. No matter what the source of the index, it will be shadowed by inescapable problems.

It must be remembered that, once adopted, this method is also applicable in the event of price-level declines. Since the long-run history of prices has been upward for many decades, it is generally felt that any price index decline would be temporary in nature, a momentary respite in the long upward march of prices.

From an accounting viewpoint, the index method of recognizing additional depreciation is fairly reasonable because it acknowledges the occurrence of price-level change year-by-year. Accrual of the depreciation deficiency conforms rather well to the accepted practices of accrual accounting.

Adjustment To Date, Plus Subsequent Annual Adjustments

THE IDEA here is that corporations be permitted to make a one-time index adjustment for accumulated depreciation deficiency, covering all the past years for existing equipment. Some proposals would have this allowed as a one-time tax-deductible "extra," to bring the situation up to date, and subsequently index-method economic depreciation would be used during the remainder of asset life. Other proposals would not allow this "one-shot" adjustment for income tax purposes, but would bring the allowances (reserves) for depreciation up to date accountingwise; thereafter index-method depreciation would be allowed for tax purposes.

If we were to take the example given previously, and assume that in the 7th year of asset life an act were passed allowing this one-time adjustment for tax purposes, the situation would be reflected in *Exhibit Two*.

Exhibit Two
Adjustment of Depreciation Allowances On One-time Basis

	Straight-line Depreciation	Base Year Index	Current Index	Col. 3 as % of Co. 2	Economic Depreciation
Years 1-7,	$ 7,000	104	7th-112	107.7	$ 7,539
8	1,000		114	109.6	1,096
9	1,000		118	113.4	1,134
10	1,000		124	119.2	1,192
Total Depreciation	$10,000				$10,961

This method would go a little further toward providing a renewal of equivalent capital facilities, allowing a retention of $500 in tax savings.

Deduction Of Added Depreciation At Retirement And Reinvestment

THE APPROACH under this method is that during asset life, the company could deduct regular original-cost depreciation, and that in the year an asset is retired from service, an additional deduction would be allowed for the deficiency in the accumulated depreciation reserve for that asset, providing certain requirements were met. Since the complaint of businesses is of insufficient retention of capital for replacement of assets, this one-time deficiency adjustment would be allowed *if the corporation actually makes such reinvestment*. It is not necessary that replacement be identical or even in kind. To impose such a stipulation would deter investment in really worthwhile improvements. The social objective of economic growth is met if the company makes any form of reinvestment expenditure at least equal to the amount of full accumulated economic depreciation. This plan is generally described as "reinvestment depreciation."

The amount of full economic (or reinvestment) depreciation is determined by use of an index in the same way as in the first method, except that only the indices for the year of acquisition and year of retirement (reinvestment) are involved. Using the same figures as before, the results are shown in *Exhibit Three*.

Exhibit Three
Reinvestment Depreciation Example

Original cost: $10,000
Life: 10 years
Index in year of purchase: 104
Index in year of retirement: 124
10th year index as % of 1st year index: 119.2
Full reinvestment depreciation: $11,920
Retention from tax savings —
52% of $1920 $998

What this plan does essentially is to put plant assets on a basis crudely resembling LIFO (Last-in, first-out), a basis on which companies have been permitted to carry inventories for quite a number of years. Under LIFO, cost of replacements for inventory items is charged to expense in the period of replacement, thereby expressing the expense of that period in the same current dollars used to measure revenues. In the reinvestment depreciation proposal, excess costs of reinvestment in the new equivalent of assets retired are charged to expense (through the depreciation account) in the year of retirement.

There is a certain amount of appeal to this plan; in the first place, it permits the business a more nearly full recoupment of the economic loss due to inflation; and it is (at least on the surface) equitable when viewed impartially from the outside, i.e., it allows compensation for the added costs of replacement (reinvestment) to those firms which actually do reinvest, but denies the privilege to those firms who make no new contributions to economic growth through reinvestment.

An added feature of the reinvest-

You are invited . . . to tell TE&M authors your problems of department policy or procedure on which you'd like to have an opinion.

ment depreciation proposals is that there are carryovers of reinvestment depreciation adjustments, for the sake of those firms whose reinvestments in facilities coincide only crudely with the retirements of depreciated assets. Such a provision is needed especially where capital projects necessarily extend over an 18-month or two-year period, or longer.

Adjustment At Retirement With Reduction Of New Asset Cost Basis

CONCESSION to the realities of the legislative process has resulted in a further adaptation of the "reinvestment depreciation" proposal. Under this adaptation the Treasury would allow businesses to deduct added depreciation in the year of retirement/reinvestment, but the amount of this extra deduction would have to be deducted from the cost basis of the new asset acquired. Consequently, the annual depreciation charges during future years (the new asset's life) would be reduced considerably. The effect is to accept a promise of bread and water for tomorrow in order to have meat and potatoes today. The mechanics of this proposal are shown in *Exhibit Four.*

Exhibit Four
Reinvestment Depreciation, with Reduced New-Asset Basis

Original asset cost	$10,000
Life	10 years
Index at purchase	104
Index at retirement	124
Reinvestment depreciation	$11,920
Added depreciation allowed over original cost	1,920
Cost of new asset, reinvestment	$11,920
Less: Added depreciation on old item	1,920
Depreciation basis for new asset	$10,000
Annual depreciation, new asset	$ 1,000

While the new asset, of equivalent value, capacity, etc., cost $11,920 (assuming an identical replacement), depreciation is allowed on only $10,000 of this cost during the life of the new asset. Presumably the same sort of one-shot reinvestment depreciation adjustment would be allowed at the end of life of the new assets. — *To be continued.*

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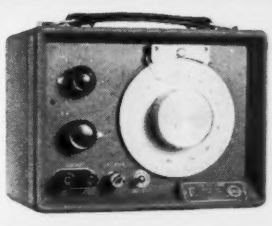

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COMMERCIAL DEPARTMENT NOTES
By ALLAN R. STACEY

Do Bill Stuffers Get Results?

Do telephone subscribers throw away most of the bill inserts without reading them? Do bill inserts influence the subscribers and cause them to act? If you have asked yourself these questions, here are some good answers.

THE OTHER evening I arrived home from work at the regular time of day and stopped on my way through the bedroom to look at the pile of incoming mail stacked on my dresser. As usual my wife had opened all the letters that would be interesting and I was left with the advertising and the bills. I deposited most of the advertising into the waste basket without looking at it (usually we never open advertising unless the sender thinks it's important enough to put four cents postage on it). I dropped the bills into the desk drawer containing items to be paid on the first of the next month while, at the same time muttering to myself, "Gee, the gas bill certainly is big this month."

The gas bill had a pretty pink stuffer in it cleverly wrapped around the bill and I, just as cleverly, extracted the bill without reading the insert and deposited the insert into the waste basket. Afterwards I began to wonder if I am a normal gas company subscriber? Did all of the subscribers throw away the bill inserts without reading them? And, further, do the telephone subscribers throw away most of our bill inserts without reading them?

Types of Inserts

TELEPHONE companies use many different types of bill inserts in an endeavor to influence subscribers. We have the institutional type which tells the public what a good job we are doing. Over the years the institutional insert creates an impression that telephone service is good quality and telephone rates are reasonable and that the telephone industry is progressive and alert.

Sometimes we put in informative inserts which tell the subscriber how to use the pages of the telephone directory, or how to use the dial when we change the type of service or change a prefix. We also use bill inserts to try to sell something to the customer. These describe the advantages of an extension telephone, or the pleasures involved in long distance calls to friends and relatives, or the beauty of telephones in color. We might even mention spring cords or jacks or other items of miscellaneous equipment.

A final type of insert is the one which attempts to learn something from the customer. It might be in questionnaire form or return postcard type whereby he checks his desires or opinion.

Bill inserts take various shapes and forms. Several companies have made excellent usage of a small multiple page publication. This is a newsy, chatty set of stories about what is going on in the telephone company or in the area served. Other companies use just a single page and try to carry one message at a time.

"Inserts" On The Outside

WHILE not technically an "insert," messages to the customer are sometimes printed on the outside of the billing envelope thus making use of it as a vehicle to reach the subscriber. Further, some companies also print a message on a return payment envelope enclosed with the billing. If you put the message in the right place, people have to read it as they seal the envelope to return their bill payment.

Several years ago one company came up with the idea of using the back of the billing envelope to promote yellow page usage. The procedure was to place on the back of the envelope cartoons with a message designed to stimulate the subscriber into reference to the yellow pages when he had a specific service need. For example, one cartoon showed a housewife with a pile of dirty clothes wondering what to do and the caption was, "In A Quandary? Call A Laundry — from the Yellow Pages."

Another drawing showed a young lady holding a hairbrush and obviously wondering what to do about her unruly mop. The caption was, "Hair Need Style? Shop Awhile — in the Yellow Pages."

The company did more than try to influence the subscriber to use the yellow pages. At the time of the next directory sales campaign, each salesman carried sample copies of the billing envelopes and showed them to prospective advertisers. His sales argument was, "Look, the telephone company is actually advertising the yellow pages. Advertising the advertising is unique in the field and will

give your ad in the yellow pages much more pulling power than ever before."

Where Do We Get The Inserts?

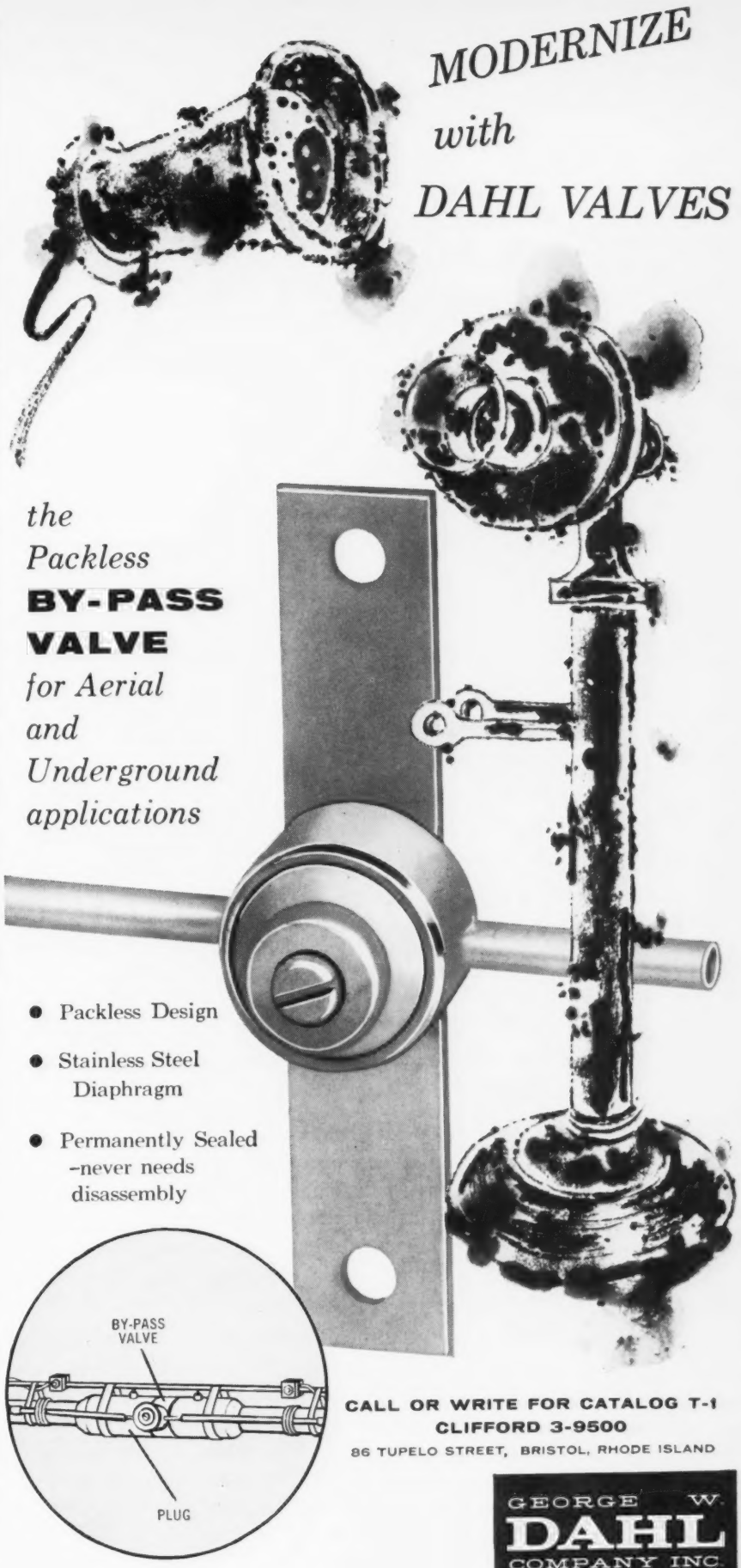
THERE ARE several places where we obtain inserts. First of all, we design and purchase our own by having a local printer set in type the material we wish to use. Secondly, we can obtain standardized bill inserts at low cost from Telephone Advertising Institute. If you are not familiar with the services of the Telephone Advertising Institute, please drop me a line and I'll see that you get some information. I recommend this service as one way for many companies to obtain some of the price benefits of printing in large lots.

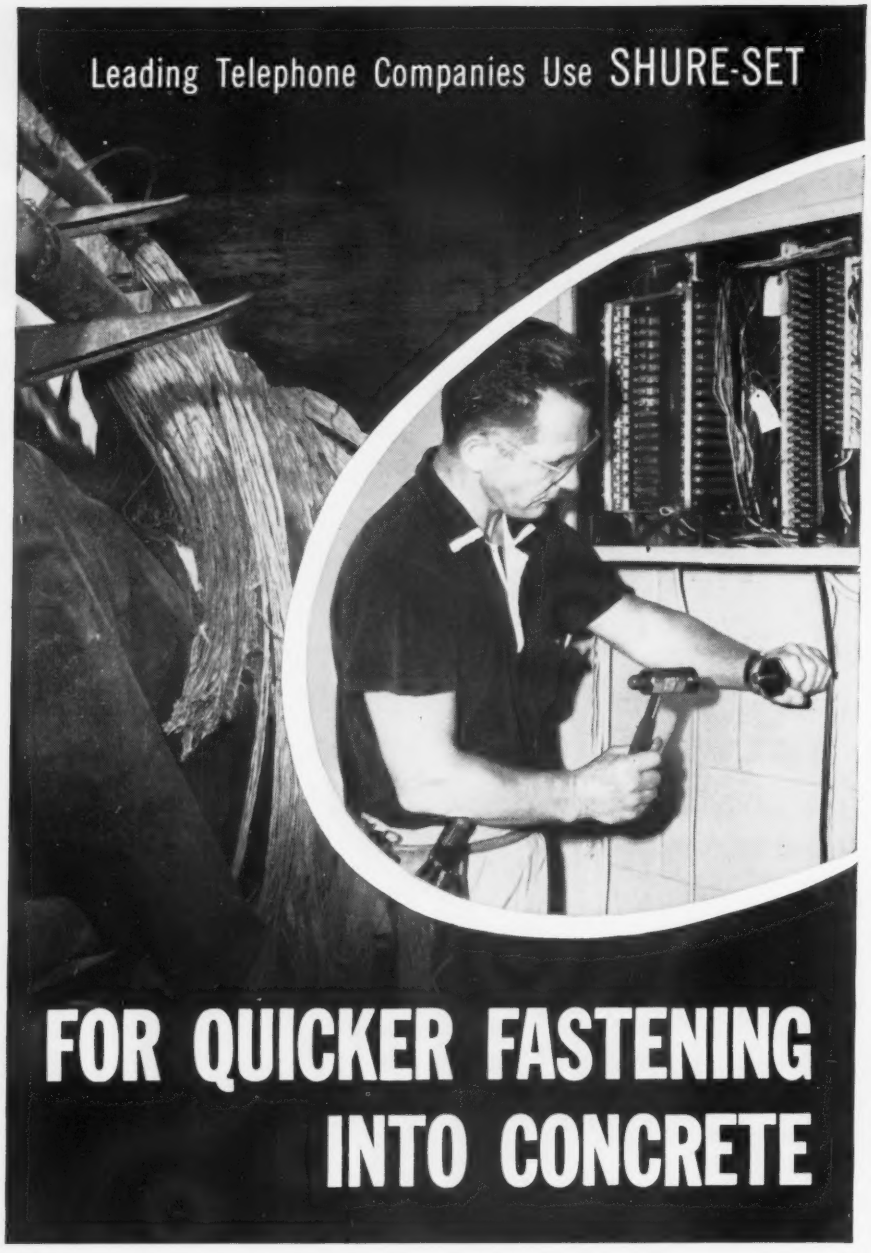
Still a third source of bill stuffers is obtaining them from suppliers of telephone equipment. I like this method because the bill inserts are made available free of charge to the telephone company. Also, those that I have seen have been well done and often come in color, which is expensive for a small telephone company to produce by itself. One caution, since bill insert material prepared by manufacturers or suppliers covers only that supplier's particular products, care must be taken that the telephone company has that item in stock and available to give to the subscriber. I remember once our company used a color telephone bill insert which showed eight colors of telephones. We happened to be stocking only six of those colors and had a minor problem when a few requests came for the colors we did not have.

Cost Of Doing Bill Inserts

UNLESS you are able to get the bill insert material on a no charge basis from suppliers, the paper and printing cost will run $3.50 or more per thousand inserts for a single page. The cost will increase proportionately with the number of pages or the additional features added to the insert.

For most companies, stuffing the insert into the billing envelope costs almost nothing. Some companies have





UNIQUE POWER CONCENTRATION PRINCIPLE

no cartridge required

Shure-Set®

. . . another product by

To cut installation time and increase worker effectiveness, a special Shure-Set fastening tool is available for the telephone industry. This hammer-in tool sets austempered fasteners into concrete without pre-drilling or plugging . . . it also converts in seconds to an efficient drill holder for "twist and turn" work.

Shure-Set tools, threaded studs, drive pins and wire loop fasteners have been thoroughly tested and proved in the laboratory and on-the-job! Now Shure-Set has been adopted by many companies as the new standard for light fastening. Write for facts today on how Shure-Set can save you time and money!

Ramset® Fastening System

OLIN MATHIESON Chemical Corporation

WINCHESTER-WESTERN DIVISION
303-D Winchester Ave. - New Haven 4, Conn.

automatic machines to do the stuffing and the adding of one more item to this machine doesn't increase the cost in any way. Other companies insert bills manually into envelopes and it is only necessary for the clerk doing the stuffing to add one more item to the job. Here also, we have very little additional cost, if any.

Now we come to the $64 question — how much good do bill inserts do in terms of influencing the cutomer and motivating him to act? Two of the larger telephone companies tell me that customers definitely do read bill inserts. One company publishing a regular small and newsy bulletin believes that more than 80% of its subscribers actually read this bulletin. The second company recently sent out a bill insert asking frank questions regarding the quality of the service being provided. This company found that better than 75% of the subscribers read those particular bill inserts.

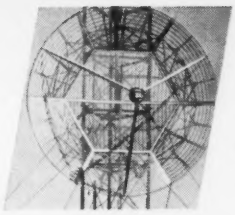
How about letting me hear from you regarding any examples that you have of the pulling power of bill inserts?

Directory Covers Again

FOLLOWING the directory cover column (February 15, 1960 TEM), I received a fine letter from *Elizabeth Journey* of the Citizens Telephone Co., Higginsville, Mo. She says that her community was troubled by salesmen for foreign plastic directories and her company responded by putting out its own clear plastic cover. They installed the company's plastic cover before the foreign advertiser put his own covers in the mail. Their covering bears the imprint, "This protective cover furnished through the courtesy of your telephone company."

Miss Journey remarks, "We thought you might be interested in our partial solution of the problem. It does seem as if there should be some more nearly permanent solution, such as the enactment of some type of legislation."

Next issue we'll talk about reactions to the Texas Telephone Association Convention which I attended. See you then. — *Allan R. Stacey.*



PLANT ENGINEERING NOTES
By JOHN S. REED

Identifier For Party Line Paystations

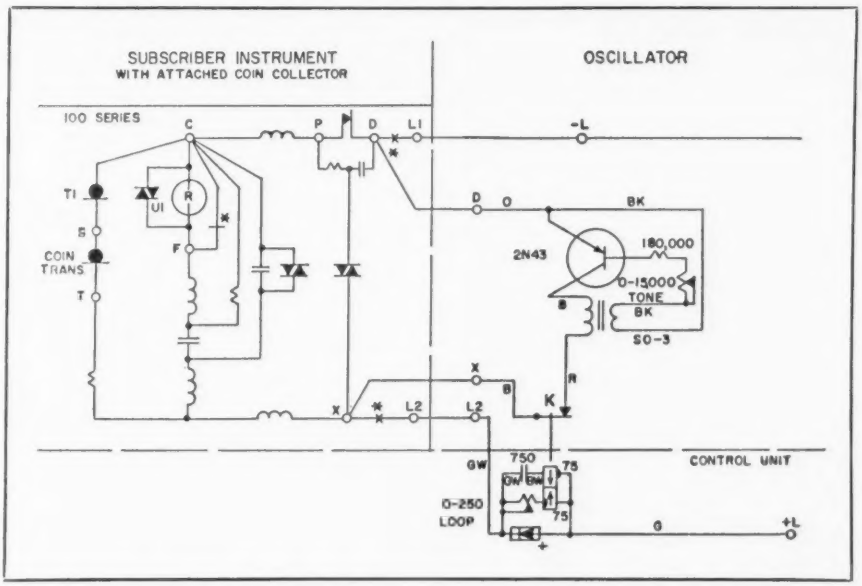
By using tone identifier equipment it is possible to install a paystation on a party line without creating difficulties for the subscribers. . . . New control unit provides door answering and intercom service for the subscriber. System is designed to work with conventional telephone instruments.

Tone Identifier For Party-Line Paystations

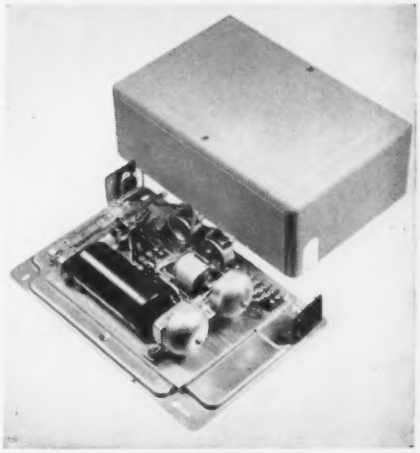
UNDER ordinary conditions, a paystation requires a private line from the central office. In resort areas, where telephone usage would be seasonal, the construction of a single line to serve a paystation would be quite expensive for the amount of revenue obtained. Likewise, in the case of rural stores and filling stations, earnings are low though constant and it is difficult to justify a private line to these locations for paystation service alone.

By using the tone identifier equipment (see illustration), it is possible to install a paystation on a party line without creating difficulties for the party-line subscriber. The tone identifier signals the operator when a call originates from a paystation instead of from a subscriber station on the same line.

The circuit of the tone identifier (see illustration) provides identifying tone for a short interval whenever reverse battery answer supervision is returned on calls from a postpay party line paystation to which it is connected. For the tone to be effective on calls to the toll operator, the toll trunks must be arranged to return reverse battery supervision when an operator answers.



Showing tone identifier and subset circuit when attached coin collector is used.



Leich Electric tone identifier for party-line paystation.

This unit cannot, therefore, be used with semi-postpay paystations, since such a battery reversal would require that a coin be deposited in that type of paystation to enable the calling party to converse with the operator. This practice is undesirable, as the coin cannot be refunded if the toll call is not completed.

The identifying equipment is designed for use with postpay paystations, in situations where coin collection is made under the aural supervision of an operator after the charge has become payable. If the exchange is a dial type, local calls from the paystation are completed without charge, and the tone applied when such a call is answered is purely incidental.

The identifier may be used on subscriber lines at stations equipped with a standard desk or wall instrument and an auxiliary coin collector.

On an incoming call to the paystation the line polarity remains normal, so that a two-winding relay K is shunted by the rectifier and remains inoperative. Although line potential is applied to the transistor after the

Loosen "Frozen" Pole Line Hardware in seconds

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Fast... New fast acting chemical compound loosens corroded ferrous nuts, bolts, studs in seconds. Eliminates sawing, speeds your pole line repairs.

Easy... Lightweight push-button can makes Kearney Rust Cutter easy to use on ground or poles. Atomized mist dissolves crystallized rust.

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For BETTER CONSTRUCTION—SAFER MAINTENANCE
Specify
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Products
386

paystation handset is lifted and the hookswitch contacts close, its polarity is such as to have no circuital effect.

When an outgoing call placed from the paystation is answered by the called local party or by the toll operator, battery is reversed to the line. This energizes the windings of the relay but since they are connected in opposition, the relay does not operate immediately. Meanwhile, positive potential biases the emitter of a p-n-p junction type transistor, permitting collector current to flow in the primary of the transformer, over the contacts of the relay to lead X. Variations in this current produce an alternating current in the transformer secondary which is applied to the base-emitter circuit of the transistor over a variable high resistance. This a-c signal is amplified by the transistor and applied to the primary of the transformer as positive feedback, which produces oscillation. The tone thus produced is audible on the line as an indication that the call has originated from a paystation.

After a 750 MF capacitor in series with one winding of the relay is nearly charged, the current flowing in this winding decreases so that it is no longer sufficient to oppose the action of that flowing in the other winding and the relay operates, opening the circuit to the oscillator after approximately one to two seconds of tone. When the paystation disconnects at the conclusion of the call, the relay releases in preparation for next call.

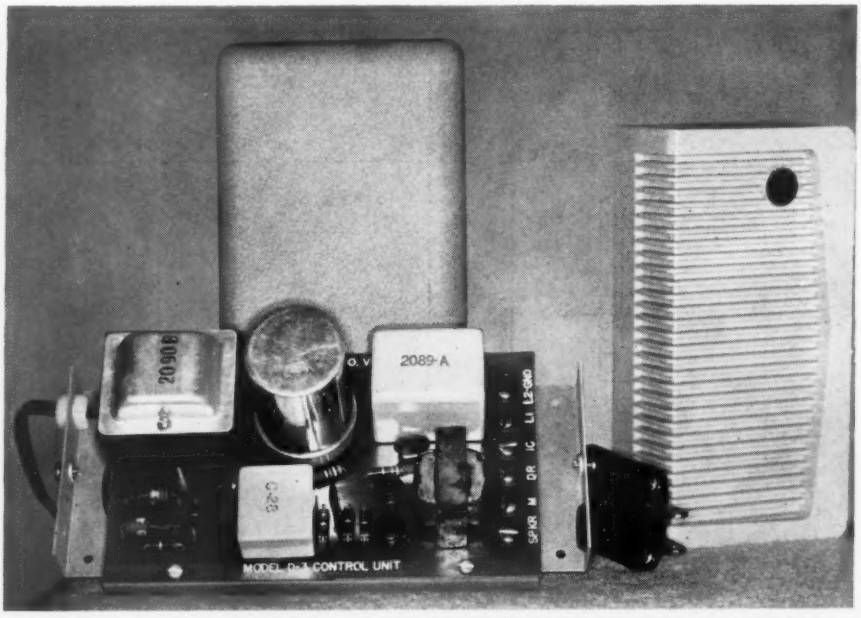
The operator may repeat the tone by unplugging her cord and then reinserting the plug. This returns battery to normal for a moment, releasing the relay and then reverses battery again, causing the oscillation to begin anew for a second period.

A potentiometer in series with one relay winding permits adjusting the identifier for operation on lines of different loop resistances. On short loops, where transmitter current is high, resistance may be inserted in series with the relay to allow the tone to remain connected to the line for a reasonable interval. On longer loops up to a maximum of 1000 ohms, the resistance may be decreased or removed. A second potentiometer in series with the base of the transistor permits some adjustment of the pitch of the tone. The latter is also dependent to some extent on the length of loop and consequent potential available at the paystation.

Telephone Door Answering And Intercom Unit Developed

AFTER two years of development and field tests with a major telephone company, a new telephone door answering and intercom unit has been placed on the market.

The Model D-3 Control Unit, to-



Model D-3 control unit for door-answering and intercommunicating service on subscribers' premises. (Orbit Industries, Inc.)

What major contractors say about CABLEGARD™

"... lowers installation costs ..."

"We wish to express our satisfaction with Cablegard. It not only lowers installation costs, but greatly increases the physical security of buried telephone plants. We first began using Cablegard a year ago, and have installed it on all our underground telephone jobs since then. We are continuing to find new uses for this product, and feel quite sure that in the near future it will have universal application."

FRANK HORTON, PRESIDENT
FRANK HORTON & COMPANY, LAMAR, MISSOURI

"... far easier (than pipe) to install ..."

"Your Cablegard has proven far easier to install, compared with pipe, for culvert and bridge crossings. We like the idea of eliminating splices and extra pedestals formerly needed for this purpose. Past practice sometimes called for burying cable in the riverbed or running piping on the bottom —which was risky, for ice and floods could ruin such an installation. Cablegard, securely fastened to bridge beams, makes a safe, practical, good-looking job. We highly recommend your product to owners and engineers."

R. J. MULLEN, PRESIDENT
MULLEN CONSTRUCTION CO., INC., APPLETON, WISCONSIN

EXCLUSIVE...

Butler Cablegard gives the protection of solid-wall pipe or conduit, above or underground. Installs in minutes, with no special skills needed. It's flanged to clamp *around* cable, avoids cost of cutting and splicing. Approved by R. E. A. (see REA Bulletin 344-2) Cablegard will put your plant construction program miles and dollars ahead!

AVAILABLE... from distributors in your area!

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KELLOGG SWITCHBOARD & SUPPLY CO. Chicago, Ill.
LEICH SALES CORPORATION Chicago, Ill.
STROMBERG-CARLSON CO. Chicago, Ill.
LINE MATERIALS INDUSTRIES Milwaukee, Wis.
SUTTLE EQUIPMENT CORP. Lawrenceville, Ill.
CRESCENT ELECTRIC SUPPLY CO. Davenport, Iowa
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WHAT'S NEW AT SUTTLE

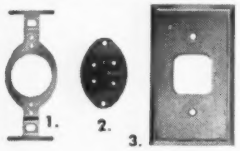
Modern Outlet Hardware Now Available from SUTTLE

SE-63A Junction Box, 45c | SE-60 Mounting Ring* | SE-493A Oval Jack $1.30 | SE-16B Face Plate*

*SE-60 and SE-16B, 45c

Modern Plug and Jack Assembly

Latest telephone practice calls for use of the SE-63A (open) junction box, SE-60 mounting ring with oval SE-493A jack, and one of several types of the SE-16 series face plates. The SE-63A junction box screws into vertical wall studs (2"x4" or other) and accepts the hardware assembly as above.



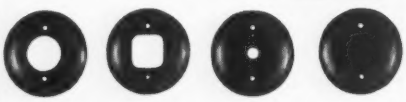
1. SE-43A Bracket 30c ea.
2. SE-493A Oval Jack $1.30 ea.
3. SE-19B Plate 28c ea.

Modern flush outlet installation utilizing SE-19B standard face plate, SE-493A oval jack, and SE-43A bracket holed for standard conduit box.

Face Plates

45c each, including SE-60 mounting ring and screws.

SE-19B



SE-16A | SE-16B | SE-16C | SE-16D

Five styles of face plates are available. SE-16A takes SE-47C multi-service, 12-terminal connecting block; SE-16B takes SE-493A jack; SE-16C for permanent phone; SE-16D for undecided service; SE-19B accepts SE-493A with SE43A bracket, or, SE-404B jack with SE-44 bracket for flush mounting.

In brown, ivory, or blue beige Write Suttle or your local distributor for installation instructions and prices on the above piece parts.

SUTTLE EQUIPMENT CORP.

401 North 15th St., Lawrenceville, Ill.
Lawrenceville 782
135 S. LaSalle St., Chicago 3, Illinois
DEarborn 2-3108

gether with one to four Model DR-3 Remote Speaker/Microphone Units, is designed to work in conjunction with conventional telephone subscriber instruments to provide "door answering" and "intercom" service on the subscriber's premises. Normally connected for outside telephone service, an option switch of a multiline telephone set enables the subscriber to hold a full duplex conversation with callers who have indicated their presence at the door by the usual doorbell call, or to page and hold full duplex conversations with other parties located on the premises.

The remote speaker/microphone device, installed in the vicinity of the area to be covered, may be partially or completely concealed, since the remote unit functions without assistance on the part of the remote party. While employed as a door answering and/or intercom device, the complete device, including the telephone instrument, is disconnected from the central office telephone line.

The equipment is placed in operation when the subscriber telephone instrument or telephone extension is lifted from its cradle ("off-hook" condition) and the option switch placed in the "door answering" or "intercom" position.

The above operation actuates the local power supply and establishes a full duplex talking circuit between the regular telephone and the remote speaker/microphone units of the selected "door answering" or "intercom" service.

The remote microphone output appears across the terminating network of the control unit where it is effectively prevented from actuating the speaker amplifier and is simultaneously applied to the receiver of the telephone instrument.

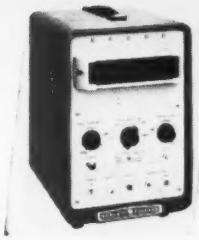
The control unit contains a transistorized speaker amplifier and receives its input from the telephone instrument. It has its output circuit connected to the speakers in the remote units. The output level of this amplifier results in sufficient talking level at the remote units to cover a normal entrance or porch area, in the presence of normal street noises, for "door answering" or the normal room area for "intercom."

The output level of the incoming speech from the remote units is comparable to normal telephone levels and may vary from —20 dbm to —15 dbm at the receiver of the telephone instrument. Hum level at both terminals is approximately 33 db below operating levels and, by virtue of the reproducers employed, is not noticeable.

Local power for the transistor amplifier, microphone and talking battery for the telephone instrument is supplied by a self-contained power supply. With the exception of the connection to the house lighting circuit (115-120 VAC 60 cycles), no voltage in excess of 24 volts appears in this equipment. The over-all power requirement for the device is approximately 3 watts, equivalent to the operating cost of the usual doorbell transformer. A single transistor is used to disable the power supply when the equipment is not in use, so that no noise or unwanted signals can appear at the remote mounted speakers.

From a maintenance point of view, having no installation adjustments, this device, employing transistors and silicon diode rectifiers, may be expected to give trouble-free service over a period of many years. The printed circuit boards of the control unit are of durable fibre glass and components are hand soldered for greater reliability.

Physical packaging has been designed to conform to standard telephone practices. The control unit D-3 is completely enclosed with aluminum base plate and drawn aluminum dust cover attached with captive screws and is 3½" wide by 7½" long by 3½" high. The base plate is designed for easy mounting on rafter or wall. The remote unit, DR-3, is attractively enclosed in a custom plastic case, stocked in grey, other colors available upon order, enclosed components are weatherproofed and provision is made for the individual telephone company to mount an emblem identifying the unit as that of the telephone company.



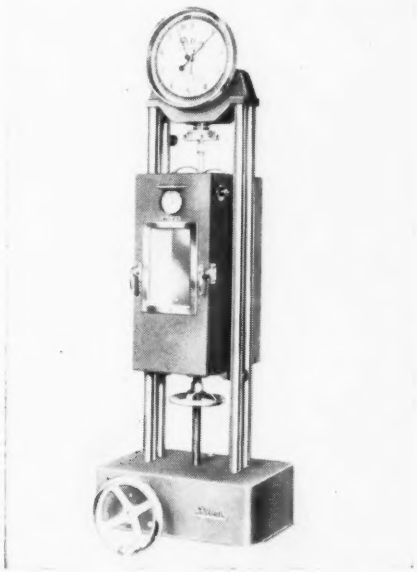
SUPPLIES AND EQUIPMENT
By DICK REYNOLDS

New Products' Showcase

Controlled-Temp. Cabinet

W. C. DILLON & Company has announced a useful accessory for its line of universal testing machines. The Dillon controlled-temperature cabinet has undergone several important changes that make it more adaptable to a variety of operating conditions.

To provide a more uniform temperature, sidewall thickness has been increased, and a positive interlock is now employed at all seams or joints.



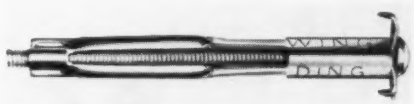
Electric heating element surface has been increased so that there is less waiting time for temperature level. The thermostat regulates heat to close degree. The new larger size observation window gives operator a clear view of the specimen under test.

The Model L tester shown above has a 20″ daylight opening. Controlled temperature cabinets will also fit 30″ and 40″ daylight opening models. Specimens are inserted in grips inside of cabinet in normal manner and can be checked in tensile, compression, transverse or shear. The instrument will apply test loads from as low as 0-250 pounds up to as high as 0-10,000 pounds. It is available either as a hand-operated or motorized unit. Dynamometer gauges are offered with 5″ or 10″ diameter dials and are readily interchangeable as to capacity. *NP* 395.

Wall Anchors

THE "WING-DING" wall anchor, from Diamond Expansion Bolt Co., is now available in a new size, made especially for telephone installations, where a light anchor is needed in thick walls.

The new size (#4LL) fits hollow walls from 5/8″ to 1¼″ in thickness



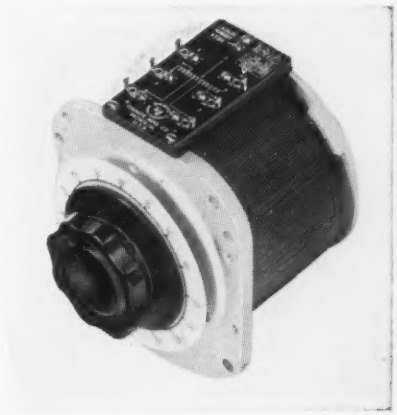
and only requires a ¼″ hole. It is a sturdy one piece anchor that is easily installed.

An installation gun is available for jobs where time saving is a major factor. *Check NP* 396.

Variable Transformers

INDIVIDUAL transformers operating from a single-phase, 240-volt line are now available from Ohmite Manufacturing Company. Model VT8H is rated 3 amperes and at maximum setting will deliver line voltage (240V) or overvoltage (280V). Model VT8HN is the "no-overvoltage" type which will deliver just line voltage at maximum setting, but offers a current bonus in its output rating of 4 amperes.

Both models are constructed on the same frame as Ohmite's VT8 series

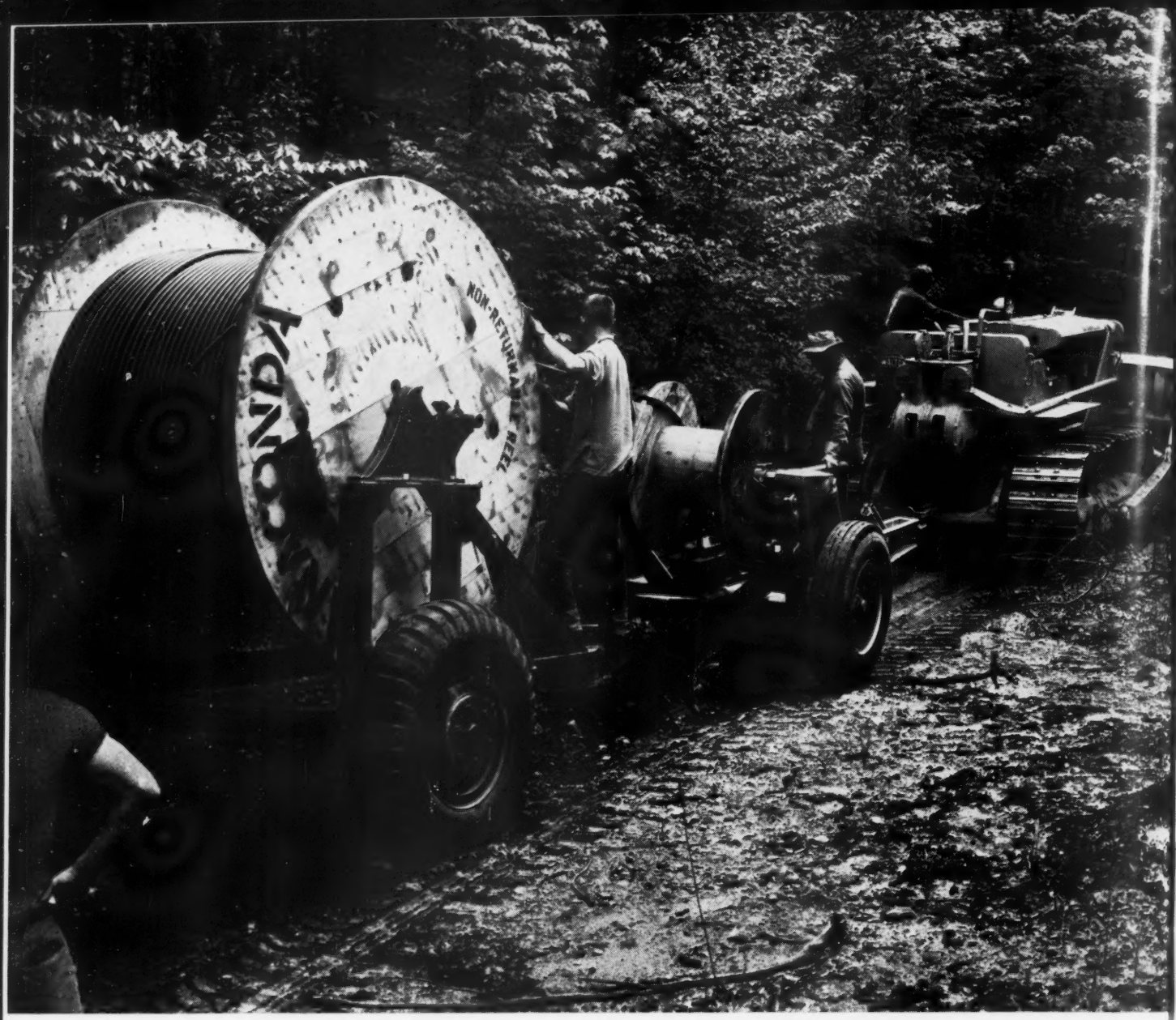


(ratings for 120-volt input types; 7.5 amperes with overvoltage; 10.0 amperes without overvoltage). The "high voltage" units afford the convenience of 140-volt, single-phase operation using a single unit instead of a ganged assembly. Of course, 240-volt, single-phase operation can also be achieved with Ohmite ganged assemblies of 120-volt input transformers where higher power output is desired. *Check NP* 397.

Harmonic Absorption Filter

A HIGH-POWER harmonic absorption filter for the SL band (1700 to 2400 MC) is now available from Sierra Electronic Corporation.

The filter, Model 204A, is designed primarily to absorb spurious and harmonic signals generated by high-power klystron and magnetron tubes. It is rated at 25 KW average power, and is capable of handling 1 megawatt of peak power. Insertion loss in the pass band is less than 0.1 db. VSWR is less than 1.1 in the pass



HERE'S HOW ANACONDA DIRECT BURIAL WIRE & CABLE MAY SAVE YOU MONEY

New advances in insulation and jacket materials, termination equipment and plowing techniques now, make Direct Burial Wire and Cable Systems more economical in many areas.

Telephone wire and cable plants are now being buried directly in the earth.

That's where Samuel Morse attempted to place the first commercial line in 1843. He designed a direct burial, fully color-coded cable for America's first telegraph line between Washington and Baltimore, but his insulation proved defective and Morse was forced to take the conductors out of the cable, separate them and string them on poles with crossarms.

Now, the four freedoms of buried plants – (1) freedom from storm damage, (2) freedom from tree clearing and retrimming expenses, (3) freedom from the safety hazards associated with power contacts and pole climbing, and (4) freedom from right-of-way procurement difficulties – can be yours at actual savings in cost.

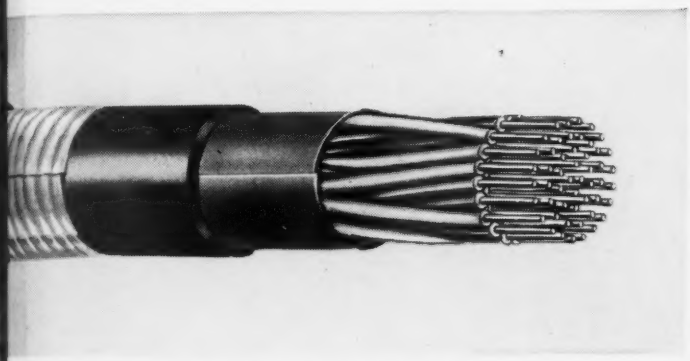
Anaconda's high-molecular weight polyethylene insulation – tough and resistant to many direct burial hazards – is part of the reason. The use of this rugged, crack-resistant material, together with new terminals and new plowing developments, have overcome most of the problems that formerly stood in the way of economical direct burial applications. Now in selected areas, a direct burial system may cost you less – in initial installation and in maintenance – than an aerial plant!

On the following pages, you will find pertinent questions and answers that show why and how Anaconda direct burial wire and cable may make possible important savings. Read these pages. Then give careful consideration to direct burial wire and cable for *your* telephone system.

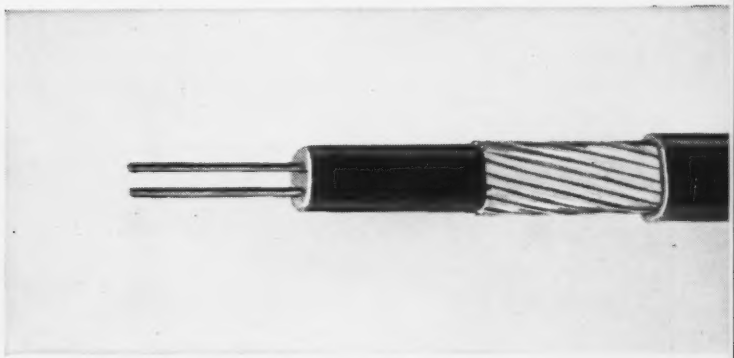
THE INSIDE FACTS ON

THE CONSTRUCTION OF ANACONDA DIRECT BURIAL TELEPHONE WIRE AND CABLE

See for yourself why Anaconda Direct Burial Telephone Cable resists underground hazards . . . gives long life and dependable service



TYPE PCP AND PCPG



TYPE BW

DIRECT BURIAL CABLE:

Cable Core: Conductors insulated with high-molecular weight color-coded polyethylene provide excellent electrical properties with great mechanical toughness and crushing resistance.

Inner Jacket: This inner jacket consists of high-dielectric strength polyethylene. It provides a second line of defense against moisture penetration in the event that the outer jacket is damaged. It also provides a high-dielectric strength barrier against lightning impulse breakdowns between the pairs and the shield.

Shield: The PCP type has 5 mils of longitudinally applied *copper* tape, rather than aluminum tape used in aerial cable. The copper provides a corrosion-resistant, low-resistance shield. This shield, coupled with the high-dielectric strength of the inner jacket, makes the over-all cable highly resistant to lightning damage. The copper shield also provides mechanical protection against the attacks of termites and rodents.

In areas where gophers are known to exist, additional protection against attacks by these rodents has been found necessary. For this purpose, the copper shield thickness has been increased from 5 mils to 10 mils and cables with this shield thickness are designated PCPG.

Outer Jacket: High-molecular weight polyethylene, highly resistant to abrasion, weathering, moisture, fungus, corrosion and environmental cracking.

DIRECT BURIAL WIRE:

Insulation: Conductors insulated in parallel with black high-molecular weight polyethylene. The insulated core has a rounded oval shape to facilitate tight fit of the steel armor wires – thus minimizing capacitance unbalance to ground.

Shield: A helical serving of closely spaced flat steel wires for mechanical protection against attacks of termites and rodents. The shield wires are flooded with an asphaltic base compound to resist corrosion. The shield, coupled with the very high-dielectric strength of the core, provides excellent resistance to lightning damage. The helical method of application of the shield wires also results in their contributing substantially to the tensile strength of the wire (over 400 pounds) which is needed to withstand stresses in installation and operation.

Outer Jacket: A tough, flexible thermoplastic jacket provides added mechanical protection for ease of installation and longevity of operation.

602243

PHONE THE MAN FROM

ANACONDA®

FOR TELEPHONE CABLE

the independent manufacturer for the independent telephone industry

Now, color conscious subscribers can be kept happy when you use WB Plastic Jacketed Beige Station Wire. A clear soft beige, harmonious in any surroundings, satisfies the most particular housewife.

WB Jacketed Station Wire is designed for fast, economical installation with stapling guns. Available in two, three and four parallel soft copper conductors. Conductors are insulated and color coded with free-stripping polyethylene and jacketed with PLASTITE in beige, brown or ivory.

WB

INDEPENDENT

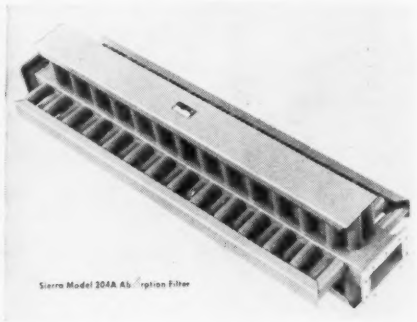
11-8 WELL BUILT WIRES SINCE 1899

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT

band and less than 1.3 above the pass band.

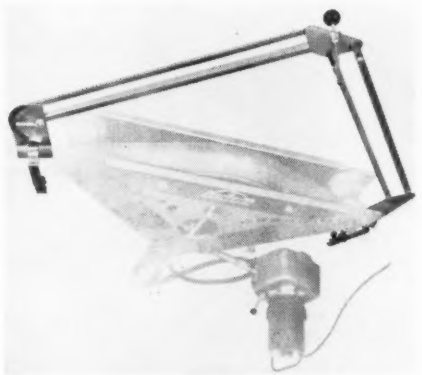
Model 204A's attenuation above the pass band is at least 40 db for all



frequencies from 3400 MC to 11,000 MC. Below the pass band, attenuation is the same as RG-104/U. The filter is 45" long, 12⅜" wide and 10⅜" high. It weighs 120 pounds. *Check NP* 398.

Pipe Bending Degree Indicator

GREENLEE Tool Company has developed a scale that accurately indicates degree of bend on any ½" to 6" diameter pipe. The No. 1807 Pipe Bending Degree Indicator fits any hydraulic pipe and conduit bender operating in a horizontal position.



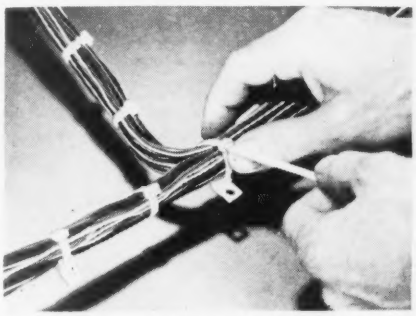
Time-consuming, on-the-job figuring is eliminated and pipe need not be removed to determine the degree of bend. Large sweep bends may be completed easily by following instructions supplied with each degree indicator. *Check NP* 399.

Wedge Lock Band Clamp

THE WECKESSER Wedge Lock Band Clamp is now available with a separate mounting tab. Because it is not an integral part of the band clamp, the tab need never be in the way at those points along the har-

ness where support is not required. At the support points, the tab can be pre-mounted to simplify planning. The band clamp and wiring can be added later, or the tab can be slipped on its clamp when the cables are bundled in advance, and the entire assembly mounted at once. Prior to locking, the tab slides around on the clamp to any desired position.

The all nylon band clamp used by itself or with the mounting tab provides a vibration-proof holding section. Ratchet teeth on the band as-



sembly engage with matching teeth inside the clamp loop. The small, two-position, floating wedge is notched and can be engaged with a rib on the inside of the loop to provide a permanent lock.

The wedge comes assembled in the clamp and will not fall out. One size band clamp will accommodate cable or wire diameters from 1/8″ to 1¾″. Once the wedge is pushed into the locked position the clamp can be released only by cutting. *Check NP* 400.

Digital Translator

A NEW DIGITAL translator which accepts any kind of digital data and provides an analog output plus control signals is now available from F. L. Moseley Co.

The instrument, Model 42, permits automatic operation of Moseley Auto-

graf or similar X-Y recorders. Accuracy of the digital-to-analog conversion is 0.1% and the accuracy of Moseley Autograf recorders is maintained.

Next page please

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- Cannot fray.

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12-8

WHITNEY BLAKE COMPANY

WELL BUILT WIRES SINCE 1899

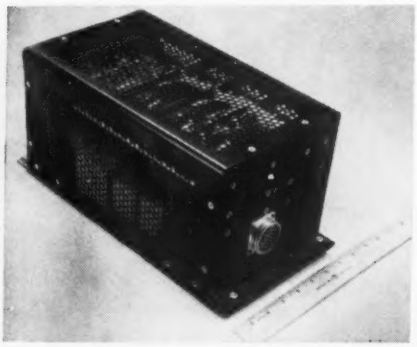
NEW HAVEN 14, CONNECTICUT

Model 42 is compatible with IBM summary punches and card readers including Models 514, 519, 523, 524, 526, etc. It may also be driven by mechanical punched tape readers such as Friden, Soroban solenoid and Teletype motorized readers, without modification to either the translator or driving equipment.

The new digital translator is supplied with a 10-key serial keyboard for manual input. It accepts 4 digits and sign per axis and provides a front panel display of matrix contents. *Check NP* 401.

Power Supply Unit

INDUSTRIAL Products Division of I. T. & T. Corp. has announced development of a four-channel power supply that provides a regulated cur-



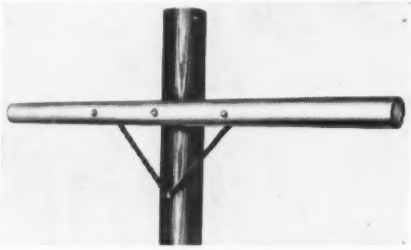
rent source over four adjustable ranges.

The power supply device can be used as a constant current reference in rotating systems, in cyclotrons, in large magnetic systems, or wherever a highly regulated supply is required.

The unit, designated ITT Model P617B, operates from a 208 volt, 3-phase, 400 cycle input. Outputs with a ripple of less than 1% RMS and regulation of better than ±.5% are available over the following four ranges, with amperage and wattage adjustable to the desired constant point within each range: 1.1 to 1.3 amps at 16.5 to 33.8 watts; 3 to 6 amps at 16.2 to 216 watts; 6 to 9 amps at 65 to 292 watts; and 3 to 5 amps at 27 to 135 watts. *NP* 402.

Fiberglass Crossarms

DEVELOPMENT of fiberglass crossarms for utility lines has been announced by Gar Wood Industries, Inc. The new crossarms, developed by a special process, provide excep-



tional electrical properties, light weight, and high resistance to weathering and insect damage.

In addition to utility applications the crossarms are also in use in radar installations. They are available in a range of sizes, with or without hardware. *Check NP* 403.

One-Man Operated Trencher

THE ARPS Corporation has announced the development of a new one-man operated trencher, the Model MA-2 Trench Devil.

Weighing approximately 1080 lbs., the unit can be skidloaded on pickup trucks or small trailers, or it may be

transported for short distances under its own power, at 3 miles per hour.

Self-propelled, the unit is operated by one man. Mechanical drive permits instantaneous reversal of direction while digging, making it possible to dig vertically alongside a well. Infinite digging speeds are also possible in either direction. *Check NP* 404.

Nylon Lineman's Suit

HODGMAN Rubber Company has announced a new nylon lineman's suit for the utilities field. The new Horcohyde coating of the suit has a soft, flexible leather-like finish that is unaffected by coldest weather yet has high abrasion resistance and is unaltered by gas, oil, grease and sun. For increased safety the suit is made in high visibility bright yellow.

The suit has non-conductive plastic or bone fasteners. The jacket has a storm flyfront, underarm ventilation holes, stand corduroy collar and detachable hood, fastened to the jacket

with three buttons. The bib-type trouser has flyfront and detachable full elastic suspenders. Each unit is completely cemented and vulcanized after making and can be bought separately as a suit. *Check NP* 405.

Four Drawer Tool Carrier

A NEW heavy duty tool carrier has been designed by Bay Products, for storage of tools and equipment necessary to set up and maintain

modern production machinery. Each of the four drawers is 15" x 23½" x 4¾" and can be padlocked individually. The entire cabinet can be moved on its 2½" diameter caster wheels where the same equipment is required for more than one machine. Cabinet is 18" x 24" x 34" high and finished in forest green baked enamel. Other one, two, and three drawer models are also available. *NP* 406.

Spur Geared Hand Hoists

A SPUR geared hand hoist with working parts enclosed in an aluminum alloy housing and frame has been introduced by Thern Machine Co. This unit is offered in eight different sizes with lifting capacities from 1/2 ton to 10-tons.

Anti-friction bearings and factory sealed lubrication of gears assures operating ease. A light hand pull of

about 75 lbs. will raise a full capacity load. Hand chain is specially formed to be easy on hands. All chains are plated for rust prevention.

Chain will not bind, regardless of pulling angle, due to rounded chain entry and a load chain guide which surrounds the drop forged load wheel. Hand chain wheel is fully covered to prevent catching of fingers.

Forged alloy steel hooks are mounted in swiveling sockets. Very little head room is required to hang this hoist; this permits full utilization of building height. *NP* 407.

Metal Trays

SKYLINE Electronics, Inc. has announced design and production of a

CONDEX* MULTIPLE CONCRETE CONDUIT

Special fittings — miters — short lengths — expanded web sections available, also adapters to claytile, transite and fiber duct.

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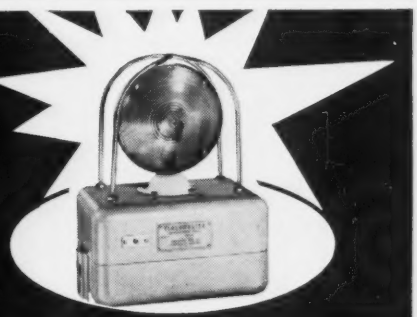

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Illustrated at top of ad is Type NXA-7 with huge 8" lens and transistorized circuit for new high in significant light output. Above, NXA-360 for 360° coverage.

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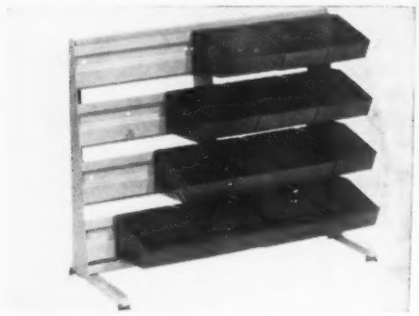
Choose the best types for your specific needs . . . unique transistorized neon-lamp units for highest power or economy types to withstand rugged use and abuse. One-way, two-way, and 360° coverage types . . . automatic and radio controls available.

CARPENTER MFG. COMPANY
618 Bradley Street, Somerville 45, Mass. Telephone MOnument 6-4300

new series of metal trays and bench stands for small parts storage and component bench assembly.

Bench stands are available in 18" and 36" widths, are welded construction of 18 gauge steel and have leveling adjustments. Chrome buttons permit sliding on bench area for assembly line work. Stands are finished in light grey enamel.

The "Simtrays" measure 2½" deep by 11½" long and come in a choice of five different widths of



from 3" to 7" wide. They are finished in dark green enamel with smooth interiors fabricated from 20 gauge steel. They were designed for use in electronic and space age businesses for the rapid assembly of products from small component parts.

For more permanent locations, "Simrails" are available for direct wall mounting. These are now made in 18", 24", 36" and 48" lengths for electrical parts, machine shop, tool room, radio and TV repair and other applications. *Check NP* 408.

Electrowriter Instruments

COMPTOMETER Corporation is now marketing a line of Electrowriter instruments which transmit written messages or sketches to any

New Electrowriter instruments by Comptometer Corp. instantaneously transmit and receive longhand communication any distance, any number of stations.

point, however distant, over telephone or radio circuits.

The transmitting party merely writes with a ball point pen on plain or form paper. As the pen is moved, the remote receiver or receivers instantly reproduce the copy as it has been written. Any number of Electrowriter instruments, in any desired combination, any distance apart, can be interconnected. No extraneous power supplies are required. The instruments are self-contained and fully transistorized.

Electrowriter systems can be used within plants or offices, permitting message service only, or alternate written messages and voice service. For longer distances, Electrowriter instruments can operate over any leased voice circuit with or without alternate telephone service. *NP* 409.

Protechtor Covers

NEW PROTECHTOR covers, offering protective covering for breakouts, branch-outs and splices, are being introduced by The Zippertubing Company.

Protechtors are available in a full range of sizes and a variety of colors. Colors of present cable jackets can be matched.

Covers may be ordered with two or more legs, and conventional "T," "Y" and fork designs are available

for distribution cable branch-outs.

Use of Protechtors eliminates need for costly molding, permits protective covering for branch-outs and splices. Reports show savings up to 90% in man hours. *Check NP* 410.

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COMPANY.....
ADDRESS.....
CITY..... ZONE..... STATE.....

Bailey and Tompers Form Int'l Teletronics, Inc.

THE FORMATION of International Teletronics, Inc., 644 Braniff Airways Building, Dallas, Texas, has been announced by its incorporators, O. C. Bailey and K. C. Tompers. Bailey is president of the company and Tompers is vice president.

According to Bailey, the company will handle sales and other services involving electronic products for the communications industries, including the telephone industry.

The company has been appointed as exclusive distributor of all products and developments of Panhandle Electric Co. of Arlington, Texas, including Panhandle's new Type X cable exchange carrier, LL subscriber and trunk carrier, and concentrator trunk carrier.

International Teletronics plans to establish sales and service offices in strategic geographical locations throughout the U. S. and Canada, according to Bailey.

Both Bailey and Tompers have been associated with the telephone industry, including the operating and manufacturing business, for many years.

A native of Greenville, Tex., Bailey's entire career has been in the telephone field. He started with Southwestern Bell Telephone Co. and was advanced from student engineer to assistant chief transmission test engineer for coaxial cable. Bailey later served as president of the Cimarron (Okla.) Telephone Co. and the Southwest Construction Co. Also he was a director of the Ruidoso (N. Mex.) Telephone Co.

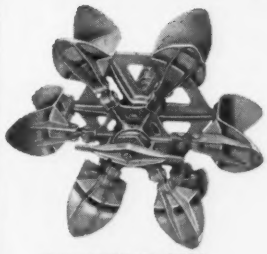
Bailey served two tours of duty as a flight officer in the middle eastern theater and later in the China-Burma-India theater. He was decorated with the distinguished flying cross, air medal with six oak leaf clusters, the distinguished unit citation, and area ribbons with four bronze battle stars.

On his return to civilian life in 1945, Bailey joined the Kellogg Switchboard & Supply Co. as a field representative in Texas. During the next 15 years, he was advanced through the Kellogg sales division to

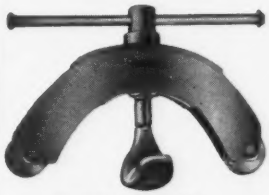
Please turn to page 65

GENERAL MACHINE PRODUCTS COMPANY, INC.

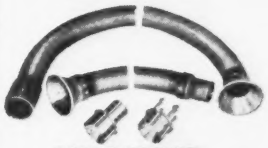
Old Lincoln Highway at Pa. Turnpike, Trevose, Pa.



C-R POWER REEL



SLACK PULLER



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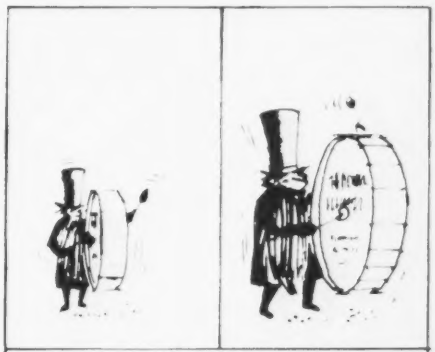

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VALUATION ENGINEERS (2) for permanent positions as specialists with Federal Communications Commission, Washington, D. C., GS-12 $8,810 to GS-13 $10,130. Must be graduate electrical engineers with good knowledge of telephone plant. Experience in depreciation (studies of plant service lives and other factors) or separations fundamentals preferable but not essential. Government will pay expense for transportation of employe, his family, and household goods to Washington. Attractive fringe benefits include retirement, life and health insurance, periodic salary increases. Good opportunity to enter government career service. Reply with Standard Form 57 to PERSONNEL OFFICER , FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON 25, D. C.

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Submarine Cable — 25 pr #19 ga., double paper, lead covered, double wire armor, jute protected. 800 ft per reel: price per reel $800. (18 reel only)

Direct Burial, 26 pr #19 ga. PILC, double steel tape armor, jute. (1400 ft only) $400. M ft.

Plastic Burial Cable 6 pr #16 ga. (stranded) with 1 #12 ga. quad. shielded PVC ins. & jacket wire armor. (sample on request)

Lead. 51 pr #19 ga. plus 4 Video pr. #16 ga. copper shielded) poly eth. ins. (1300 ft only) $750. per M ft.

Special Purpose cable available for immediate delivery at special low prices. Interior & exterior types. Lead, plastic and braid Switchboard cable available at special prices.

Twisted Drop Wire #104, Copperweld 40% Neoprene covered, $50. per M ft.

Twisted Pair Drop #20, Copperweld 40% Neoprene, $15.00 M ft.

QUADDED CABLE lead

7 quad #19 ga. PILC (100,000 ft) 3-4 M ft. per reel, $200. per M ft.

37 quad #19 ga. PILC 1050 ft, $650. per M ft.
7 quad #19 ga. Plastic Superior, 5300 ft, $250. per M ft.

11 pr #19 ga. PILC 4500 ft reels, 24,000 ft total, $200. per M ft.

26 pr #19 ga. Neoprene 1400 ft (not coded), $250. per M ft.

101 pr #22 ga. Plastic 1300 ft, $750. per M ft.
303 pr #22 ga. Ankoseal 775 P, 2000 ft, $2. per foot.

Flexible Neoprene cables for elevator and other mobile use from 5 pair to 40 pair (also unpaired multiconductor).

Drop Wire, Neoprene (reinforced) #18 ga. Copperweld. Slightly used A-1 condition, in coils of approx. 500 ft lengths, $10. per M ft.

Satisfaction Guaranteed — we ship on approval — freight allowed on carloads

The Telectric Co.

1218 VENICE BOULEVARD **Telephone: RIchmond 8-2249** **LOS ANGELES 6, CALIF.**
(DDD 213)

TELEPHONE MARKET PLACE

(Continued from page 63)

PROFESSIONAL SERVICES

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GENERAL ENGINEERS

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2000 Lbs. Capacity trailer. For ALL materials including pay out take up cable, line wire and drop wire. Priced RIGHT Write for illustrated literature NOW TODAY

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When answering the classified advertisements in this magazine don't forget to put the box number on your envelope. It's our only means of identifying the advertisement you answer.

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SPRING TENSION GAUGE
Extremely accurate for determining settings or checking tension of relay and other springs.
- Well made — accurately calibrated.
- Definite and dependable.

Construction: Nickel silver frame with scale calibrated—front and back. Indicating spring. Folding handle. Adjustable tension attachment.

STG-2-D — (#70-D type) 50-0-50 grams, 5 gram steps.
STG-2-J — (#70-J type) 0-150 grams, 5 gram steps.
STG-2-H — (#70-H type) 0-30 grams, 2 gram steps.
STG-2-F — (#70-F type) 10-0-10 grams, 1 gram steps.

P. K. NEUSES, INC. PROMPT SHIPMENT
511-21 N. Dwyer St., Arlington Heights, Ill.

Get Cash For Your Business!

If you have an exchange or any other kind of business to sell, advertise it in TELEPHONE ENGINEER & MANAGEMENT. Your ad will reach more prospects than you can reach in any other telephone publication. Place your ad today.

How To Place Your Ad

Send your ad to "Telephone Market Place," TELEPHONE ENGINEER & MANAGEMENT, 7720 N. Sheridan Rd., Chicago 26, Ill. Or call ROgers Park, 4-3040, Chicago, Ill.

Use This Space to Print or Type Your Classified Advertising Message

CLASSIFIED RATES: 15¢ per word, minimum charge $2.00. Cash with order. Add 4 words for box number. Closing deadline: Copy in written form in Chicago office no later than 15 days preceding publication date.

DISPLAY CLASSIFIED RATES: Take card rate of $7.00 per column inch, and card discounts, size and frequency apply.

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I am enclosing $.....

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Company .....

Street .....

City ..... Zone..... State.....

Clip and mail this form to: — >

The TELEPHONE MARKET PLACE
TELEPHONE ENGINEER & MANAGEMENT
7720 N. Sheridan Road, Chicago 26, Ill.

(Continued from page 61)

vice president and director of marketing, the position he resigned on Feb. 1 to become associated with International Teletronics, Inc.

Tompers, a native of Susanville, Cal., has had wide experience in the telephone operating field, having served as plant superintendent of the San Joaquin Telephone Co. of Manteca, Cal.; equipment engineer of West Coast Telephone Co. at Forest Grove, Ore., and central office equipment engineer of Public Utilities California Corp. (Now Citizens Utilities Co.)

In 1947, Tompers joined Kellogg Switchboard & Supply Co. as equipment installer. Later he became a field representative, division sales manager at St. Paul, Minn., Western regional manager, and field sales manager with headquarters in Chicago. In 1959, he became marketing manager for Kellogg, which position he resigned on Feb. 1 to join International Teletronics, Inc., as vice pres.

Gen. Tel. Dir. Transfers Schewe and Mertens

GENERAL Telephone Directory Company has announced that Paul E. Schewe has been transferred from division manager of the Spokane, Washington Division to division manager of the Durham, North Carolina Division. Schewe started with the directory company in 1947 as a sales representative in Texas. He received

PAUL E. SCHEWE

JOIN THE NATION'S TOP RELAY ENGINEERING TEAM

In the field of relay engineering, the acknowledged growth leader is C. P. Clare & Co. Our many FIRSTS in the industry start with our top-notch engineering team.

Continuous expansion requires a search for qualified men to join this select group. Here is your opportunity to be in on the ground floor of a company whose record proves that your rapid advancement and increased remuneration are assured.

Look at the facts

- **STARTING SALARY** — well above industry average.
- **PROFIT SHARING** — 15% of annual wage. None higher in the nation. Company profits are your profits.
- **ADVANCEMENT** — You'll be more than satisfied with your progress. We're known for our lack of employee turnover problems.
- **SMALL COMPANY ATMOSPHERE** — No chance of being lost in the shuffle.
- **FRINGE BENEFITS** — You receive full fringe benefits including major medical plan.
- **LOCATION** —Northwestern Chicago — minutes from the beautiful northern suburbs.
- **RELOCATING** — All expenses paid. Company will assist in securing housing if requested.

This is only an outline of the C. P. Clare story. If you would like to find out more, send us a description of your background. All inquiries will be without obligation and held in strictest confidence.

Contact: R. N. ARTHUR, Personnel Manager

C. P. CLARE & CO.

3101 PRATT BLVD. • CHICAGO 45, ILLINOIS

AMbassador 2-7700

"Off The Board"

Communications Securities

Markets as of March 17, 1960

	DIVIDEND	BID	ASKED	LAST SALE
American Tel. & Tel.	3.30			86⅝
Anglo-Canadian Tel. (Brit. Col. & Dom. Rep.)	1.20	30½	31¼	
Bell. Tel. of Canada	2.20			45½
British Columbia Tel.	2.20	44	44½	
Calif. Interstate Tel. (Calif., Nev.)	.70	13⅞	14⅜	
Calif. Pac. Util. (new) (Calif., Ore., Nev.)	.90	19	19¾	
Calif. Water & Tel.	1.28	26⅛	26½	
Carolina Tel. & Tel. (Carolina)	1.60	39	—	
Central Elec. & Gas (Minn., Ill., Ia., Wis., Va.)	1.00	23¾	24	
Central Telephone (Minn., Ia., N. C., Va.)	.88	21	21⅜	
Chenango & Unadilla Tel. (N. Y.)	1.20	27	28	
Cincinnati & Suburban Tel. (Ohio)	4.50	88	89	
Citizens Utilities (Calif., Pa.) "A"	stk. only	14	14⅜	
Citizens Utilities (Calif., Pa.) "B"	.52½	12	12½	
Commonwealth Tel. Co. (Pa.)	.90	20	20¾	
Florida Tel. Co.	1.00	26	26¾	
Gen. Tel. & Electronics	2.20			74
Hawaiian Tel. Co. (Hawaii)	1.00	20¼	20¾	
Indiana Telephone Co. (Ind.)	.50	21	—	
Inter-County Tel. & Tel. (Fla.)	2.00	57½	59½	
Inter-Mountain Tel. (Va. & Tenn.)	.80	15¾	16¼	
Jamestown Tel. (N. Y.)	5.60	80	—	
Lincoln Tel. & Tel. (Neb.)	2.60	63½	—	
Lorain Tel. Co. (Ohio)	1.40	33	—	
Middle States Tel. Co. (Ill.)	1.00	25¼	26¼	
Mountain States Tel. (Ariz., Colo., Mont., Tex., etc.)	6.60			175¾
New England Tel. & Tel. (New England states)	1.72			35⅝
North Carolina Tel. (N. C.)	none	1⅜	1½	
Northern Ohio Tel. (Ohio)	1.60	52	54	
Pacific Tel. & Tel. (Calif., Wash., Ore., Nev., Ida.)	1.14			27⅛
Peoples Telephone (Pa.)	4.00	88½	—	
Pioneer Tel. Co. (Minn., N. D.)	1.00+stk	36	37½	
Rochester Telephone (N. Y.)	1.00			24⅛
Southeastern Tel. (Fla.)	.90	19	20	
Southern New England Tel.	2.20	44¾	45¼	
Southern Nevada Tel. (Nev.)	1.00	20½	21½	
Southwestern States Tel. (La., Ark., Okla., Tex.)	1.20	22⅜	22¾	
Tel. Serv. Co. of Ohio "A" (Ohio)	2.80	148	152	
Tel. Serv. Co. of Ohio "B" (Ohio)	2.80	150	—	
Tidewater Telephone Co. (Va.)	1.40	25½	—	
United Utilities	1.40	38½	39	
West Coast Tel. (Wash., Ore., Calif.)	1.20	23½	23¾	
Western Union Telegraph	1.40			49¾
Western Utilities	.36	7½	7⅞	
Western Light & Tel. (Mo., Ia., Kans.)	2.00	41	42	

(Source of market — DEAN WITTER & CO.)

promotions to senior sales representative, sales supervisor, assistant division manager and in August 1958 was made division mgr. in Spokane.

With Schewe's transfer to Durham, T. J. Mertens was promoted to assistant division manager of the Spokane Division. Mertens had been with the directory company six and one-half

T. J. MERTENS

years and for the five years prior to his promotion, he was a sales supervisor in the Spokane Division.

Graybar Names Three To Advertising Posts

R. B. SAYRE, vice president of the Graybar Electric Co., Inc., has announced the appointments of Edwin Lex Bacon as general advertising and sales promotion manager; Raymond C. Babcock as advertising manager; and Ralph Sackett, Jr. as sales promotion manager. Babcock and Sackett will report to Mr. Bacon.

Bacon has been with the company since 1939 in the advertising and sales promotion department at Graybar's New York headquarters, and was made dept. mgr. in 1958.

Babcock joined Graybar in 1943 at the general headquarters. He spent two years in Seattle as sales promotion manager, and returned to New York in 1950 as assistant advertising and sales promotion manager.

Sackett began in 1952 in Graybar's Florida District. He was made sales promotion manager at Tampa in 1956, and was transferred to New York, where he worked on sales programming and training.

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Wire for all type spinners

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STAINLESS STEEL

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COPPER

LASHING WIRE

WE PRODUCE

The finest lashing wire possible because we believe . . . that lashing wire is one of the important parts of the cable plant, its duty being to hold the cable to the messenger for the life of the plant.

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WE COIL

The best coil possible because we know . . . that tangled or out of shape coils can cause spinning trouble, waste and delay.

Write for Complete Information

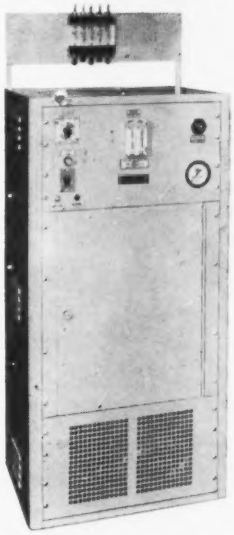
CABLE SPINNING EQUIPMENT CO.

Topeka Kansas

NEW! from S&G

THE MODEL "RC" DEHYDRATOR

AUTOMATIC IN OPERATION



NEW MODEL "RC" cabinet mounted

The Model "RC" Dehydrator is designed to supply dry air to aerial and underground telephone cables. It is especially suited for small installations of 80 miles or less of cable. Wall or relay rack-mounted, the Model "RC" is approximately 24" high, 28" wide and 8" deep. Operating voltage is 115 volts, 1 phase, 60 cycle, and the output is 700 standard cubic feet per day maximum, with a dewpoint of —65°F. Other outstanding features are:

- Hi-Lo pressure switch for alarm
- Humistat for alarm above 4% Relative Humidity.
- Power failure relays and separate fustat
- By-Pass Valve & Alarm for excessive Relative Humidity.
- Mechanical control valve for stand-by air supply (O.P.N.) in event of power failure
- Additional safety features on air compressor
- Power supply is 115-volt, AC on the Dehydrator and Air Compressor

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Crapo

HTL-195

EXTRA HIGH-TENSILE TELEPHONE LINE WIRE

for low-cost Rural Lines

• Spans up to 600 feet in Heavy Loading, 650 feet in Medium Loading and 700 feet in Light Loading districts are possible where Crapo HTL-195 is employed. This extra long span construction results in marked savings in costs per mile of line. Pole structures can be reduced to a minimum. Fewer pole structures mean substantial savings both in materials and man-hours of labor. There is less hauling to be done, fewer holes to dig, less material to be handled, installed and connected.

Improved electrical qualities make practical typical subscriber loops of 14 to 15 miles with normal voltages and equipment. Also can be used for subscriber carrier.

Write for Engineering Manual No.TM-59

INDIANA

STEEL & WIRE CO., INC.
MUNCIE, INDIANA

THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Busy Day For A Groundhog

According to the editor of *Long Lines* there are people in Roane County, West Virginia, who feel that the ground hog has been overidealized. As practically any almanac will tell you, the ground hog (or woodchuck) is allegedly a weather prophet. February 2, or Candlemas, is his day and the theory is that if, on that date, he comes out of his winter quarters and sees his shadow there will be six more weeks of winter. If the day is cloudy (and there is no visible shadow) he stays above ground because spring is just around the corner.

One particular West Virginia ground hog failed to do his duty. He just plain didn't care what the weather was going to be. He was hungry and so he assuaged his appetite by staying below ground and gnawing at a telephone cable. By the time he had chewed through two layers of insulation and through six of 12 19-gauge copper wires, many customers discovered that their service had gone temporarily "dead." Repairmen located the trouble, and service was quickly restored.

The *Long Lines* editor did not point out what happened to the ground hog. He passed it up by saying, "We'll merely pass on a friendly suggestion. People who mind their own business and don't go around causing trouble are far happier in the long run. . . ."

Korean Name Change

► ***The Hung Up Bank*** *in Seoul, South Korea, has changed its name to Han-Il Bank, according to a Reuters report. English-speaking customers complained the bank's telephone operators were answering incoming calls by saying, "Hang up."*

Bell Gets Biggest Patent Yet

The Bell Telephone Laboratories, Inc., of New York has received the largest patent ever granted. It covers elaborate improvements to the *American Telephone & Telegraph Company's* automatic accounting system for charges on long distance direct dialing.

The copy sent to the inventor, Amos E. Joel Jr., weighs 10 pounds and 12 ounces. It consists of 354 sheets of drawings and 266 printed pages. In contrast, some patents issued last month covered a single sheet of paper; the average is five and a half pages.

Joel's invention is an assembler-computer, now in use in the New York area and elsewhere. Although highly complex, it is relatively compact, occupying about twenty by fifteen feet in floor space.

Why Teen-Agers Tie Up The Phone

The telephone-monopolizing teen-ager may actually be acting out a depression, a psychiatrist said last month.

Dr. James M. Toolan of Bellevue Hospital, New York City, said the adolescent boy or girl who spends endless hours jabbering to teen-age friends may be trying to bolster spirits and banish mood dejection.

"They seek constant stimulation by means of talking, parties, telephoning, radio, etc.," said Dr. Toolan.

What's good about Warren ringing generators...

without any ringing generalizations

A spare generator for emergency use is shown in the space second from left.

All right — no ringing generalizations. Just facts — and here they are:

FACT #1 — Warren Transistor Ringing Generators are battery powered, multi-frequency, transistor ringing generators. They provide stable, continuous, on-frequency ringing in the harmonic, synchromonic and decimonic series for up to 4,000 lines (25 watt models) or 8,000 lines (50 watt models).

FACT #2 — They offer longer life — each component is conservatively derated for trouble-free operation, designed for 30 year life.

FACT #3 — They are more stable. A unique zero phase shift oscillator holds all ringing frequencies to a drift of less than $\frac{1}{6}$ of a cycle, eliminating the need for any frequency adjustment.

FACT #4 — They are more compact, with the most space-saving design available — requiring only $10\frac{1}{2}''$ vertical space on standard relay racks.

FACT #5 — They offer up to 80% full-load efficiency. This means BIG power savings — just $\frac{1}{3}$ to 1/10 the power required by other ringing generators.

Need more facts? They're yours for the asking. Just write or call (collect):

WARREN TMR 50 (50 watt, 5 frequency ringing generator)

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THE WARREN MFG. COMPANY, INC.

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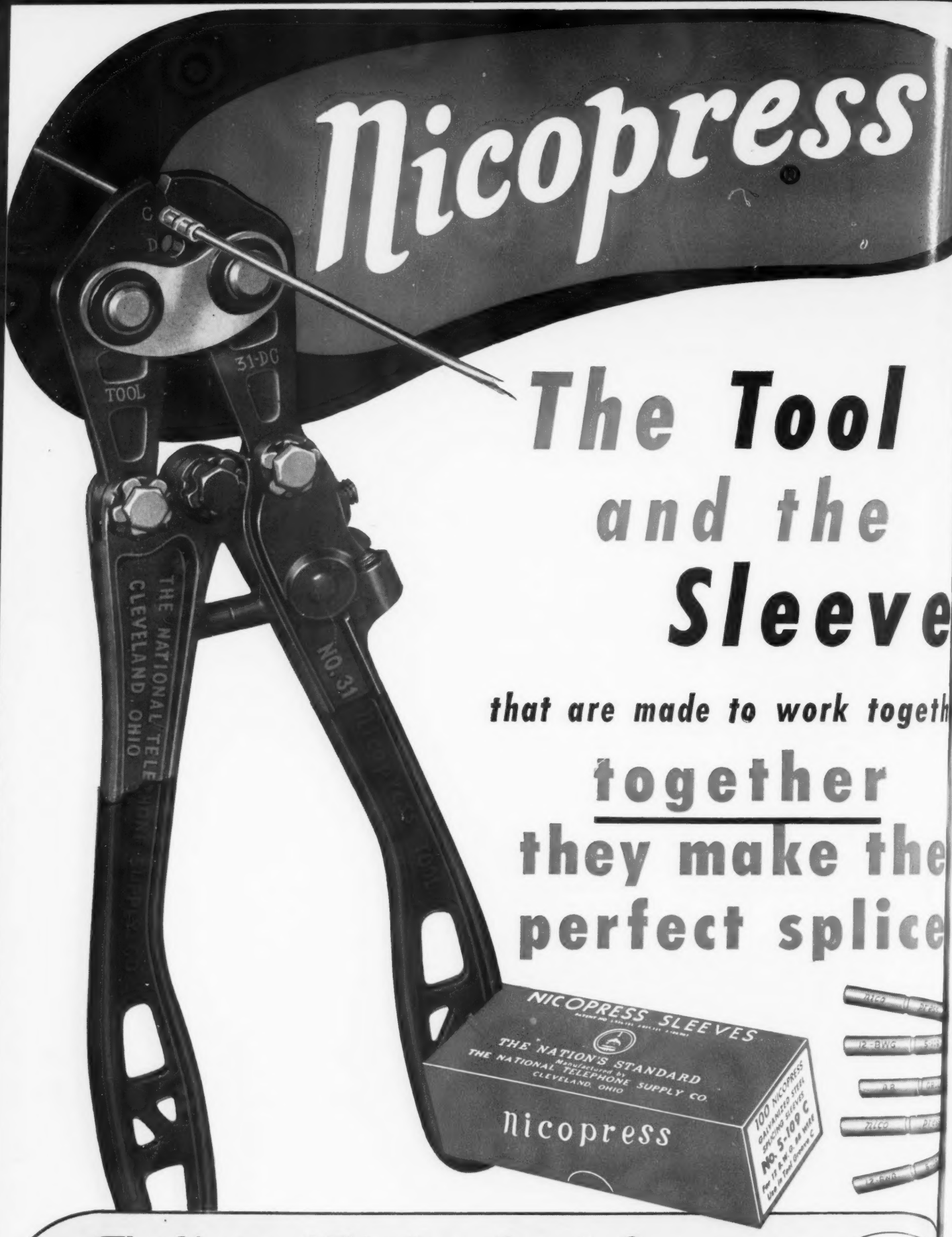

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together

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